DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AB91

Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Colorado River Endangered Fishes: Razorback Sucker, Colorado Squawfish, Humpback Chub, and Bonytail Chub

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Fish and Wildlife Service designates critical habitat for four species of endemic Colorado River Basin fishes: Razorback sucker (*Xyrauchen texanus*), Colorado squawfish (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), and bonytail chub (*Gila elegans*). These species are listed as endangered under the Endangered Species Act of 1973, as amended. The critical habitat designated is located primarily on Federal land and, to a lesser extent, on tribal, State, and private lands. The designation provides additional protection required under section 7 of the Act with regard to activities that require Federal agency action. The Service designates 3,168 km (1,980 mi) of critical habitat for the four Colorado River endangered fishes in portions of Colorado, Utah, New Mexico, Arizona, Nevada, and California. The areas designated for each species also overlap some areas designated for the other species.

EFFECTIVE DATE: April 20, 1994.

ADDRESSES: The complete file for this rule is available for public inspection, by appointment, during normal business hours at the office of the Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, 2060 Administration Building, 1745 West 1700 South, Salt Lake City, Utah 84104.

FOR FURTHER INFORMATION CONTACT: Reed E. Harris, Field Supervisor, at the above address, telephone 801/975–3630.

SUPPLEMENTARY INFORMATION:

Background

The four endangered fishes are endemic to the Colorado River Basin (Basin), which consists of portions of seven Western States. The Basin drains approximately 627,000 km ^{2} (242,000 mi ^{2}) within the United States and has been politically divided into an Upper and Lower Basin. The Upper Basin consists of portions of the States of Colorado, New Mexico, Utah, and Wyoming. The Lower Basin consists of portions of the States of Arizona, California, and Nevada. An additional 5,000 km ^{2} (2,000 mi ^{2}) of the Basin lies within Mexico.

Historically, the native fish fauna of the Basin was dominated by the minnow (cyprinids) and sucker (catostomids) families (Minckley et al. 1986). The four species of concern, the razorback sucker (*Xyrauchen texanus*), Colorado squawfish (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), and bonytail chub (*Gila elegans*) are listed as endangered under the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). These fishes are threatened with extinction due to the cumulative effects of environmental impacts that have resulted in habitat loss (including alterations to natural flows and changes to temperature and sediment regimes), proliferation of nonnative introduced fish, and other man-induced disturbances (Miller 1961; Minckley 1973; U.S. Fish and Wildlife Service [USFWS] 1987; Carlson and Muth 1989).

Natural Colorado squawfish populations survive only in the Upper Basin, where their numbers are relatively high only in the Green River Basin of Utah and Colorado (compared with other rivers in the Upper Basin) (Tyus 1991). Razorback sucker and bonytail chub populations throughout the Basin consist predominately of old adult fish. Populations persist primarily because of the longevity of these species (USFWS 1990a; Minckley et al. 1991), although some experimental and augmentation programs have stocked fish in the Basin. Humpback chub populations in the Little Colorado River, Black Rocks, and Westwater Canyon in the Colorado River appear relatively stable in number of fish, but declines have occurred in other locations (USFWS 1990b).

The historical ranges of the four endangered fishes have been fragmented by construction of dams and water diversions throughout the Basin (Carlson and Muth 1989). The Fish and Wildlife Service (Service) believes that it is important to the survival and recovery of these species to maintain and reestablish populations in geographically distinct areas within their historic range that provide varying thermal, chemical, geological, and physical parameters required for maintenance of genomes.

Conservation of these four species will require the identification and management of water resources and habitat components that are considered important to any fish species, such as spawning areas, nursery grounds, and interactions with predators and competitors. However, because the four endangered fishes are present in such low numbers, basic life history and habitat use information has been difficult to obtain. Changes to the historical Colorado River Basin ecosystem that have resulted in a lack of reproduction and/or recruitment have been hypothesized as factors in their endangerment (USFWS 1990a, 1990b, 1991; Minckley et al. 1991). In this case, not only would a lack of successful recruitment lead to small numbers of fish, but over time, remnant stocks may lose genetic diversity. Ultimately, extinction could result because the loss of genetic diversity may make populations less able to adjust to environmental change.

Habitats and Status of Endangered Fish

Affected Environment

The four Colorado River endangered fishes evolved in the Colorado River Basin (Basin) and were adapted to the natural environment that existed prior to the beginning of large-scale water development and introduction of nonnative species. This natural environment was characterized by highly fluctuating seasonal and annual flows, distinctly different habitat types (i.e., whitewater, lower gradient and meandering main channels, off-channel backwaters, and others) and varying water quality (i.e., sediment load, temperature, salinity, etc.). Recent population declines and disappearances of endemic Basin fish species from much of their former range have been associated with the onset of rapid and widespread anthropogenic changes to the natural environment. The cumulative environmental impact of these changes has resulted in alteration of the physical and biological characteristics of many rivers in the Basin. These impacts presumably occurred so rapidly that the fish could not adapt to them (Carlson and Muth 1989). Dams and diversions have fragmented former fish habitat and restricted fish movement. As a result, genetic interchange (emigration and immigration of individuals) between some fish populations is no longer possible. High flood flows were once normal in the Basin and provided food and nutrient exchange between river channels and shallow-water flood plain habitats. These high flows are now controlled by numerous dams. As a result of these dams, major changes also have occurred in water quality, quantity, temperature, sediment load

and nutrient transport, and other characteristics of the aquatic environment (Carlson and Muth 1989). The altered river conditions that have resulted now provide suitable habitats for introduced, nonnative fish. Some of these nonnative fish species have flourished in the Basin (Minckley et al. 1982; Tyus et al. 1982; Carlson and Muth 1989). These physical and biological changes have impacted the river environment to the extent that no completely unaltered habitat remains in the Basin for the four Colorado River endangered fish species.

Razorback Sucker

This species once was abundant and widely distributed in rivers of the Basin (Jordan and Evermann 1896; Minckley 1973). In the Lower Basin, the razorback sucker remains in the Colorado River from the Grand Canyon to near the border with Mexico. With the exception of the relatively large stock of razorback suckers remaining in Lake Mohave (an estimated 25,000 individuals), these populations are small and recruitment is virtually nonexistent (Minckley et al. 1991). The formerly large Lower Basin populations have been virtually extirpated from other riverine environments (Minckley et al. 1991). In the Upper Basin, this species remains in the lower Yampa and Green Rivers, mainstream Colorado River, and lower San Juan River (Tyus et al. 1982; Minckley et al. 1991; Platania et al. 1991); however, there is little indication of recruitment in these remnant stocks. The largest extant riverine population occurs in the upper Green River Basin. It consisted of only about 1,000 fish in 1989 (Lanigan and Tyus 1989); recent information suggests that this population may have declined to less than 500 fish (USFWS unpublished data). In the absence of conservation efforts, it is presumed that all wild populations in the Basin would soon be lost as old fish die without sufficient natural recruitment.

Reproduction and habitat use of razorback suckers has been studied in Lower Basin reservoirs, especially in Lake Mohave. Fish reproduction has been visually observed along reservoir shorelines for many years. The fish spawn over mixed substrates that range from silt to cobble and at water temperatures ranging from 10.5 to 21° C (51 to 70° F) (reviewed by Minckley et al. 1991).

Habitat use and spawning behavior of adult razorback suckers in riverine habitats has been studied by radiotelemetry in the Green River Basin (Tyus and Karp 1990) and in the upper Colorado River (Osmundson and Kaeding 1989). Fish in the Green River Basin spawn in the spring with rising water levels and increasing temperatures. Razorback suckers move into flooded areas in early spring and begin spawning migrations to specific locations as they become reproductively active, and spawning occurs over rocky runs and gravel bars (Tyus and Karp 1990).

In nonreproductive periods, adult razorback suckers occupy a variety of habitat types, including impounded and riverine areas, eddies, backwaters, gravel pits, flooded bottoms, flooded mouths of tributary streams, slow runs, sandy riffles, and others (reviewed by Minckley et al. 1991). Summer habitats used include deeper eddies, backwaters, holes, and midchannel sandbars (Osmundson and Kaeding 1989; Tyus and Karp 1990; Minckley et al. 1991). During winter, adult razorback suckers use main channel habitats that are similar to those used during other times of the year, including eddies, slow runs, riffles, and slackwaters (Osmundson and Kaeding 1989; Valdez and Masslich 1989; Tyus and Karp 1990).

Habitats used by young razorback suckers have not been fully described because of the low number of young fish present in the Basin. However, most studies indicate that the larvae prefer shallow, littoral zones for a few weeks after hatching, then disperse to deeper water areas (reviewed by Minckley et al. 1991). Laboratory studies indicated that in a riverine environment, the larvae enter stream drift and are transported downstream (Paulin et al. 1989).

Based on available data, Tyus and Karp (1989) and Osmundson and Kaeding (1989) considered that cumulative environmental impacts from interactions with nonnative fish, high winter flows, reduced high spring flows, seasonal changes in river temperatures, and lack of inundated shorelines and bottom lands are factors that potentially limit the survival, successful reproduction, and recruitment of this species.

Colorado Squawfish

This species is the only living representative of the genus *Ptychocheilus* endemic to the Basin. Fossils from the Mid-Pliocene epoch (about 6 million years ago) indicate that early *Ptychocheilus* had physical characteristics that were similar to modern forms. Native populations of the Colorado squawfish are now restricted to the Upper Basin in Wyoming, Colorado, Utah, and New Mexico. Colorado squawfish populations have been extirpated from the Lower Basin.

Colorado squawfish spawning has been documented in canyons in the Yampa and Green Rivers (Tyus 1991). This reproduction is associated with declining flows in June, July, or August and average water temperatures ranging from 22 to 25 °C (72 to 77 °F) depending on annual hydrology. River mile 130 on the Colorado River, near the Colorado-Utah State line, also has been identified as a spawning site, and radio-tagged adults have moved to a specific 0.2 km (0.1 mi) area in four different years (Osmundson and Kaeding 1989; USFWS unpublished data 1992–1993). In the mainstream Colorado River, McAda and Kaeding (1991) stated that spawning occurs at many locations. They also suggested that Colorado squawfish spawning in the Colorado River may have been adversely impacted by construction of mainstream dams and a 48 percent reduction in peak discharge. On the San Juan River, a spawning reach has been identified between river mile 133.4 and 129.8, near the confluence of the Mancos River (Ryden and Pfeifer 1993).

After spawning, adult Colorado squawfish utilize a variety of riverine habitats, including eddies, backwaters, shorelines, and others (Tyus 1990). During winter, adult Colorado squawfish use backwaters, runs, pools, and eddies, but are most common in shallow, ice-covered shoreline areas (Osmundson and Kaeding 1989; Wick and Hawkins 1989). In spring and early summer, adult squawfish use shorelines and lowlands inundated during typical spring flooding. This natural lowland inundation is viewed as important for their general health and reproductive conditioning (Osmundson and Kaeding 1989; Tyus 1990). Use of these habitats presumably mitigates some of the effects of winter stress, and aids in providing energy reserves required for migration and spawning. Migration is an important component in the reproductive cycle of Colorado squawfish. Tyus (1990) hypothesized that migration cues, such as high spring flows, increasing river temperatures, and chemical inputs from flooded lands and springs, may be important to successful reproduction.

In the Green River Basin, larval Colorado squawfish emerge from spawning substrates and enter the stream drift as young fry (Haynes et al. 1989). The larval fish are actively or passively transported downstream for about 6 days, traveling an average distance of 160 km (100 mi) to reach nursery areas in lower gradient reaches (Tyus and Haines 1991). These areas are nutrient-rich habitats that consist of

ephemeral along-shore embayments that develop as spring flows decline.

Humpback Chub

Remains of humpback chub have been found in archaeological sites dated to about 4000 B.C. (USFWS 1990b). This Colorado River native fish was not described as a species until 1946 (Miller 1946). This has been attributed to its presently restricted distribution in remote, white water canyons (USFWS 1990b). The historical abundance and distribution of the species is not well known. In the Lower Basin, the humpback chub occurs in the Little Colorado and Colorado Rivers in the Grand Canyon. This population is the largest remaining in the Basin. In the Upper Basin, humpback chub are found in the Black Rocks/Westwater Canyon and Cataract Canyon of the Colorado River, Desolation and Gray Canyons of the Green River, and Yampa and Whirlpool Canyons in Dinosaur National Monument, Green and Yampa Rivers (USFWS 1990b).

Humpback chub in reproductive condition are usually captured in May, June, or July, depending on location. Spawning occurs soon after the highest spring flows when water temperatures approach 20° C (68° F) (Karp and Tyus 1990; USFWS 1990b). The importance of spring flows and proper temperatures for humpback chub is stressed by Kaeding and Zimmerman (1983), who implicated flow reductions and low water temperatures in the Grand Canyon as factors curtailing successful spawning of the fish and increasing competition from other species.

Populations of humpback chub are found in river canyons, where they utilize a variety of habitats, including pools, riffles, and eddies. Most of the existing information on habitat preferences has been obtained from adult fish in the Little Colorado River, the Grand Canyon, and the Black Rocks of the Colorado River (Holden and Stalnaker 1975; Kaeding and Zimmerman 1983; Kaeding et al. 1990). In these locations, the fish are found associated with boulder-strewn canyons, travertine dams, pools, and eddies. Some habitat-use data also are available from the Yampa River Canyon where the fish occupy similar habitats and also use rocky runs, riffles, rapids, and shoreline eddies (Karp and Tyus 1990). This diversity in habitat use suggests that the adult fish are adapted to a variety of habitats, and studies of tagged fish indicated that they move between habitats, presumably in response to seasonal habitat changes and life history needs (Kaeding and Zimmerman 1983; Karp and Tyus 1990). Reduced spring peak flows, availability of shoreline eddy and deep canyon habitats, and competition and predation by nonnative fish were reported as potential limiting factors for humpback chub in the Yampa River (Tyus and Karp 1989). The impact of hybridization with other species is currently being evaluated.

Bonytail Chub

The bonytail chub (also known as the bonytail) is the rarest native fish in the Basin. Historically reported as widespread and abundant in rivers throughout the Basin (Jordan and Evermann 1896), its populations have been greatly reduced. The fish is presently represented in the wild by a low number of old fish (i.e., ages of 40 years or more), and recruitment is virtually nonexistent. In the Lower Basin, a small population persists in the Colorado River in Lake Mohave, and there are recent records from Lake Havasu (USFWS 1990a). In the Upper Basin, recent captures have been from Dinosaur National Monument on the Yampa River, Desolation and Gray Canyons on the Green River, and Black Rocks and Cataract Canyon on the Colorado River (Kaeding et al. 1986; Tyus et al. 1987; Valdez 1990; USFWS 1990a).

The bonytail chub is adapted to mainstream rivers, where it has been observed in pools and eddies (Minckley 1973; Vanicek 1967). In reservoirs, the fish occupies a variety of habitat types (Minckley 1973). In Lake Mohave, Wagner (1955) observed the fish in eddy habitats. Spawning requirements have never been documented in a river, but Vanicek and Kramer (1969) reported that spawning occurred in June and July at water temperatures of about 18° C (64° F). The available data suggest that habitats required for conservation of the bonytail chub include, river channels, and flooded, ponded, or inundated riverine habitats that would be suitable for adults and young, especially if competition from nonnative fishes is reduced (USFWS 1990a).

Previous Federal Actions

Listing Chronology

The Colorado squawfish and humpback chub were listed as endangered species on March 11, 1967 (32 FR 4001) and the bonytail chub was listed as endangered on April 23, 1980 (45 FR 27713). Critical habitat for these species was not designated at the time of their listing. On May 16, 1975, the Service published a notice of its intent to determine critical habitat for the Colorado squawfish and the humpback chub, and other species (40 FR 21499). On September 14, 1978, the Service proposed 1,002 km (623 mi) of the Colorado, Green, Gunnison, and Yampa Rivers as critical habitat for the Colorado squawfish (43 FR 41060). The proposal was for 1,002 km (623 mi) of the Colorado, Green, Gunnison, and Yampa Rivers. This proposal was later withdrawn (44 FR 12382; March 6, 1979) to comply with the 1978 amendments to the Act (16 U.S.C. 1531 *et seq.*).

The razorback sucker was first proposed for listing as a threatened species on April 24, 1978 (43 FR 17375). The proposal was withdrawn on May 27, 1980 (45 FR 35410), to comply with provisions of the 1978 amendments to the Act. These provisions required the Service to include consideration of designating critical habitat in the listing of species, to complete the listing process within 2 years from the date of the proposed rule, or withdraw the proposal from further consideration. The Service did not complete the listing process within the 2-year deadline.

On March 15, 1989, the Service received a petition from the Sierra Club, National Audubon Society, The Wilderness Society, Colorado Environmental Coalition, Southern Utah Wilderness Alliance, and Northwest Rivers Alliance to list the razorback sucker as endangered. The Service made a positive finding in June 1989 and subsequently published a notice in the **Federal Register** on August 15, 1989 (54 FR 33586). This notice also stated that the Service was completing a status review and was seeking additional information until December 15, 1989. A proposed rule to list the razorback sucker as endangered was published in the **Federal Register** on May 22, 1990 (55 FR 21154).

The final rule listing the razorback sucker as an endangered species was published on October 23, 1991 (56 FR 54957), but critical habitat was not proposed. In the final rule, the Service concluded that critical habitat was not determinable at the time of listing and questioned whether it was prudent to designate critical habitat.

On October 30, 1991, the Service received a 60-day notice of intent to sue from the Sierra Club Legal Defense Fund. The subject of the notice was the Service's failure to designate critical habitat concurrent with listing of the razorback sucker pursuant to section 4(b)(6)(c) of the Act. The Sierra Club Legal Defense Fund followed this with a second notice of intent to sue dated January 30, 1992. At a meeting on December 6, 1991, the Service concluded that designation of critical

habitat was prudent and determinable and therefore in compliance with the Act. The Service had no alternative but to designate critical habitat for the razorback sucker. Because the intent of the Act is "* * * to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved * * *," the Service also decided to propose critical habitat for the Colorado squawfish, humpback chub, and bonytail chub. The four endangered Colorado River fish species coexist in the Basin and much of their habitat overlaps.

On May 7, 1992, the Sierra Club Legal Defense Fund on behalf of the Colorado Wildlife Federation, Southern Utah Wilderness Alliance, Four Corners Action Coalition, Colorado Environmental Coalition, Taxpayers for the Animas River, and Sierra Club filed a lawsuit in the U.S. District Court (Court), Colorado, against the Service for failure to designate critical habitat for the razorback sucker. On August 18, 1992, a motion for summary judgment was filed requesting the Court to order publication of a final rule to designate critical habitat within 90 days. On October 27, 1992, the Court ruled that the Service had violated the Act by failing to designate critical habitat when the razorback sucker was listed. The Court ordered the Service to publish a proposed rule within 90 days designating critical habitat for the razorback sucker using presently available information, and to publish a final rule at the earliest time permitted by the Act and its regulations. To take no action towards designation of critical habitat would continue to place the Service in violation of the Act and was not a feasible alternative.

The Service published the proposed rule to designate critical habitat on January 29, 1993 (58 FR 6578). At that time, the Service had not completed an economic analysis or a biological support document. The Service published the Draft Biological Support Document for public review on September 15, 1993, and reopened the public comment period (58 FR 48351). On September 21, 1993, the Court held a hearing on the Sierra Club Legal Defense Fund "Motion For A Timetable For Publication Of Final Rule" on the designation of critical habitat. On November 19, 1993, the Court directed the Service (1) not to submit an interim final rule, (2) to provide a 60-day comment period for the economic analysis, (3) to provide notice of the exclusion process and request comments, and (4) to publish the final rule by March 15, 1994.

Notice of availability of the Economic Analysis, an Overview of the Proposed Critical Habitat Designation, and a request for public comments were made in the **Federal Register** on November 12, 1993 (58 FR 5997), and in a November 9, 1993, letter sent to interested parties. The public comment period closed on January 11, 1994. On January 18, 1994, the Service conducted the exclusion process, assessing all the information pertinent to a decision to exclude areas from designation as critical habitat for economic or other relevant reasons.

Recovery Planning

Recovery plans have been written for three of the four listed Colorado River fishes. The Colorado Squawfish Recovery Plan was approved on March 16, 1978, and revised on August 6, 1991 (USFWS 1991). The Humpback Chub Recovery Plan was approved on August 22, 1979, with a first revision on May 15, 1984, and a second revision on September 19, 1990 (USFWS 1990b). The Bonytail Chub Recovery Plan was approved on May 16, 1984, with a revised plan approved September 4, 1990 (USFWS 1990a). Recovery goals contained in these recovery plans have been used in identifying and evaluating critical habitat for these three species. A recovery plan for the razorback sucker has not been completed.

Determination of Critical Habitat

Definition of Critical Habitat

"Critical habitat," as defined in section 3(5)(A) of the Act, means: "(i) the specific areas within the geographical area occupied by the species at the time it is listed * * *, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed * * *, upon a determination by the Secretary that such areas are essential for the conservation of the species."

The term "conservation," as defined in section 3(3) of the Act, means: "* * * the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." In the case of critical habitat, conservation represents the areas required to recover a species to the point of delisting (i.e., the species is recovered and is removed from the list of endangered and threatened species). In this context, critical habitat preserves options for a species' eventual recovery. Section 3(5)(C) further states that: "Except in those circumstances determined by the Secretary, critical habitat shall not include the entire geographical area which can be occupied by the threatened or endangered species."

Role of Critical Habitat in Species Conservation

The designation of critical habitat will not, by itself, lead to recovery but is one of several measures available to contribute to conservation of a species. Critical habitat helps focus conservation activities by identifying areas that contain essential habitat features (primary constituent elements) regardless of whether or not the areas are currently occupied by the listed species. Such designations alert Federal agencies, States, the public, and other entities about the importance of an area for the conservation of a listed species. Critical habitat also identifies areas that may require special management or protection. Areas designated as critical habitat receive protection under section 7 of the Act with regard to actions carried out, funded, or authorized by a Federal agency that are likely to adversely modify or destroy critical habitat. Section 7 requires that Federal agencies consult on their actions that may affect critical habitat and insure that their actions are not likely to destroy or adversely modify critical habitat.

Designation of an area as critical habitat only affects Federal actions that may occur in the area. Designation does not create a management plan for a listed species. Designation does not automatically prohibit certain actions, establish numerical population goals, prescribe specific management actions (inside or outside of critical habitat), nor does it have a direct effect on habitat not designated as critical habitat. However, critical habitat may provide added protection for areas designated and thus assist in achieving recovery.

Areas Outside of Critical Habitat

Areas outside of critical habitat that contain one or more of the primary constituent elements may still be important for conservation of a species. Also, some areas do not contain all of the constituent elements and may have those missing elements restored in the future. Such areas also may be important for the long-term recovery of the species even if they were not designated as critical habitat. Areas not designated as critical habitat also may be of value in maintaining ecosystem integrity and supporting other species,

indirectly contributing to recovery of a species.

Areas outside of critical habitat are still subject to section 7 consultation on whether or not an action is likely to jeopardize the continued existence of a species, and section 9 "take" prohibitions for an action that may affect Colorado River endangered fishes or their habitat. The Service anticipates that the importance of areas outside of critical habitat to the conservation of the Colorado River endangered fishes will be addressed through section 7, section 9, and section 10 permit processes, the recovery planning process, and other appropriate State and Federal laws.

Primary Constituent Elements

In determining which areas to designate as critical habitat for a species, the Service considers those physical and biological attributes that are essential to species conservation (i.e., constituent elements). Such physical and biological features are stated in 50 CFR 424.12 and include, but are not limited to, the following items: (1) Space for individual and population growth and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally;

(5) Habitats that are protected from disturbance or are representative of the historical geographical and ecological distributions of a species.

In addition, the Act stipulates that the areas containing these elements may require special management considerations or protection.

Detailed descriptions and the biological basis for the constituent elements were presented in the Draft Biological Support Document (Maddux et al. 1993). In considering the biological basis for determining critical habitat, the Service focused on the primary physical and biological elements essential to the conservation of the species. The primary constituent elements are interrelated in the life history of these species. This relationship was a prime consideration in the designation of critical habitat. The Service is required to list the known primary constituent elements together with a description of any critical habitat that is designated.

The primary constituent elements determined necessary for survival and recovery of the four Colorado River endangered fishes include, but are not limited to:

Water

This includes a quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species.

Physical Habitat

This includes areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. In addition to river channels, these areas also include bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas in the 100-year flood plain, which when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats.

Biological Environment

Food supply, predation, and competition are important elements of the biological environment and are considered components of this constituent element. Food supply is a function of nutrient supply, productivity, and availability to each life stage of the species. Predation and competition, although considered normal components of this environment, are out of balance due to introduced nonnative fish species in many areas.

Additional Selection Criteria for the Razorback Sucker

Because a recovery plan for the razorback sucker has not been completed, additional selection criteria were developed to assist the Service in making a determination of areas to propose as critical habitat. Previous Service findings, published and unpublished literature sources, and discussions with individual members of the Colorado River Fishes Recovery Team were utilized to develop the constituent elements and additional selection criteria.

Adult razorback suckers have displayed a degree of versatility in their ability to survive and spawn in different habitats. However, razorback sucker populations continue to decline and are considered below the survival level. Thus, as versatile as the adult life stage of razorback sucker appears to be in selecting spawning habitat, there has been little or no recruitment of young to the adult population. Therefore, special consideration was given to habitats required for reproduction and recruitment.

The following selection considerations were used by the Service to help determine areas necessary for survival and recovery of the razorback sucker.

1. Presence of known or suspected wild spawning populations, although recruitment may be limited or nonexistent.

2. Areas where juvenile razorback suckers have been collected or which could provide suitable nursery habitat (backwaters, flooded bottom lands, or coves).

3. Areas presently occupied or that were historically occupied that are considered necessary for recovery and that have the potential for reestablishment of razorback suckers.

4. Areas and water required to maintain rangewide fish distribution and diversity under a variety of physical, chemical, and biological conditions.

5. Areas that need special management or protection to insure razorback survival and recovery. These areas once met the habitat needs of the razorback sucker and may be recoverable with additional protection and management.

The primary constituent elements were identified throughout the historical range of the Colorado River endangered fishes. In addition, the five selection considerations described above also were used to evaluate potential razorback sucker critical habitat areas. The critical habitat designations were based on the primary constituent elements, published and unpublished sources of information, Service reports and other findings, recovery plans (for Colorado squawfish, humpback chub, and bonytail chub), the additional selection considerations, and the Service's preliminary recovery goals for the razorback sucker.

Adjustments to Boundaries

The 100-year flood plain is generally included as part of the critical habitat designation; however, only those portions of the flood plain that contain the constituent elements are considered part of critical habitat. Specific areas in the flood plain must be evaluated on a case-by-case basis to determine if the areas constitute critical habitat. The Service stresses that, although critical habitat may only be seasonally occupied by the fish, such habitat remains important for their conservation. Protection of such seasonally occupied habitats contributes to the conservation of the species.

As a result of obtaining additional biological information and review of comments received during the public

comment period, the Service has determined that some areas are not required for the survival and recovery of the fishes because they do not contain the constituent elements, meet the additional selection criteria, or are not in historical habitat. In addition, other areas may contain constituent elements but may contribute little to the prospect of recovery for one or more of the four fishes. Some of these areas are within sections of designated critical habitat and will be evaluated on a case-by-case basis. Five stream sections are separable and have been removed from consideration as part of critical habitat because of a lack of biological importance. These five areas are:

- Davis Dam to the upstream end of Topock Marsh on the mainstem Colorado River (AZ, CA, NV) (bonytail chub)
- Bonita and Eagle Creeks, tributaries to the Gila River (AZ) (razorback sucker)
- Cherry and Canyon Creeks, tributaries to the Salt River (AZ) (razorback sucker)
- Sycamore, Oak, and West Clear Creeks, tributaries to the Verde River (AZ) (razorback sucker)
- The Verde River from Sullivan Lake to Perkinsville (AZ) (razorback sucker)

The Service reiterates that any or all of these sections could contribute to the recovery of one or more of the fishes; however, they do not provide a primary recovery area and are considered only marginally important. The Service also notes that some of these areas may not have been historical habitat for the razorback sucker, a further indication that these areas may have only limited value in the recovery of these fishes.

Economic Impacts

Introduction

Section 4(b)(2) of the Act directs the Secretary of the Interior (Secretary) to consider economic and other relevant impacts in determining whether to exclude proposed areas from the final designation of critical habitat. The Service, as delegated by the Secretary, may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of inclusion, provided that exclusion will not result in extinction of a species. An economic analysis (Brookshire et al. 1994) was conducted on the consequences of this action (critical habitat designation).

The study region for the economic analysis includes the seven States of the Basin: Arizona, California, Colorado, New Mexico, Nevada, Utah, and Wyoming. The timeframe chosen for the study, 1995 through 2020, encompasses the time period projected for the recovery of the endangered fishes.

Linkages between the biological requirements for recovering the endangered fishes and economic activities in the region formed the basis for the economic analysis. As an index of these biological requirements, adjustments made in the operations of Federal reservoirs in the Basin and/or mitigation of nonflow related activities along the river's 100-year flood plain were included. The effects of recovery efforts on future water depletions in the Basin also were taken into consideration. The direct and indirect impacts of these possible changes on current and prospective economic activities were then estimated for each State, the region, and the national economy.

It is impossible to predict the outcome of future section 7 consultations involving endangered fishes in the Basin. If the Upper Basin and San Juan Recovery Implementation Programs (RIP) do not show sufficient and timely progress in recovering the endangered fishes, some planned water developments may be modified, scaled back, delayed, or foregone. This assumption provides an upper bound on the potential magnitude of economic impacts associated with the critical habitat designation. If the RIP's are successful in achieving their objectives, many of the negative economic impacts can be avoided.

Economic Modeling

Two types of economic effects are of interest when considering the economic impacts of critical habitat designations: regional economic impacts and national economic efficiency impacts. Regional economic impacts refer to the direct and indirect impacts of the critical habitat designations on specific geographic regions, such as States or other subregions of the country.

Regional economic impacts were analyzed using input-output (I–O) models that organize the basic accounting relationships that describe the production sector of the economy (Brookshire et al. 1993). The I–O method is based on the assumption that all sectors of the economy are related, and the production of a good or service can be described by a recipe whose ingredients are the outputs from other sectors of the economy. The primary inputs are labor, capital, and other raw resources. Through its multiplier analysis, the I–O model is capable of generating estimates of the changes in output for economic sectors, changes in employment, and changes in income due to the critical habitat designation. The models report total impacts resulting from interactions among the sectors of the economy.

National economic efficiency impacts refer to the overall net impacts on the national economy after the effects of interregional transfers have been accounted for. The goal of a national efficiency analysis is to determine whether an action would have an overall positive or negative impact on the national economy.

National economic efficiency impacts were analyzed in this study using a Computable General Equilibrium (CGE) model. The CGE model captures the economic interactions of consumers, the production sectors, and the government sectors. The CGE model also analyzes resource reallocations (e.g., changes in river flows as represented by increased or decreased hydroelectric generation) in a manner such that the net effects, not just the total effects, are calculated. Given this capability, the CGE model is able to estimate net national efficiency impacts.

Modeling Approach

A separate I–O model was developed for each State, and focused on the direct and indirect impacts generated by the critical habitat designation (Brookshire et al. 1993). In most cases, impacts in a given State generated impacts in neighboring States. Thus, it was necessary to investigate potential offsetting impacts. As a result, an I–O model was constructed that investigated the impacts of the entire region (all seven States). In addition to the State and regional I–O models, a CGE model was developed for the economies of the seven-State area and the rest of the United States. This model provided a comprehensive aggregate assessment of the national economic efficiency impacts.

Economic activity for the models was estimated using Impact Analysis for Planning (IMPLAN) 1982 data sets that were updated and projected through the year 2020, using data from the Bureau of Economic Analysis of the U.S. Department of Commerce. The IMPLAN data set contains 528 economic sectors that were aggregated to 20 sectors (Brookshire et al. 1994).

Without Fish and With Fish Scenarios

Two scenarios were used to evaluate economic activities associated with the critical habitat designation (Brookshire et al. 1994). The "without fish" economic scenario consisted of projections of the level of economic activities that would be observed over the study period if no action was taken to recover the endangered fishes. The

"with fish" scenario was constructed by analyzing potential changes in economic activity that may occur due to the critical habitat designations and/or other protection and recovery efforts for endangered fish.

Economic Setting

Economic Output

Economic output measures the value of all goods and services produced and/or consumed in a regional economy. The seven State Basin region generates about $1.3 trillion annually in economic output. This output is dominated by the combined manufacturing and the finance, insurance, and real estate sectors, which produce 18.4 percent and 14.9 percent of total output, respectively. The recreation services sector produces 7.7 percent of the total output and the combined agricultural sectors are responsible for 3.0 percent of the total output (Brookshire et al. 1993).

Employment

Approximately 22.0 million people are employed in the Basin economy. The largest employment sectors within the Basin States are the public sector (16.9 percent of total employment), and the combined manufacturing sector (15.4 percent of total employment). The recreation services sector is also a very significant part of total employment at 10.5 percent. Combined agricultural employment is approximately 4.3 percent of total employment (Brookshire et al. 1993).

State and Regional Economic Impacts

Three conclusions were obtained from the economic analysis (Table 1): First, regional economic impacts associated with critical habitat designation are positive for the Basin. Second, the State-level impacts are not distributed evenly over States in the Basin. Finally, the percent deviation in the economy from the "without fish" scenario is small.

TABLE 1.—ANNUALIZED IMPACTS ($1991 MILLIONS) OF CRITICAL HABITAT DESIGNATION IN EACH STATE AND THE COLORADO RIVER BASIN. PARENTHESES ( ) = PERCENT CHANGE IN THE STATE AND REGIONAL ECONOMIES DUE TO DESIGNATION. (AFTER BROOKSHIRE ET AL. 1994)

State	Output (% change)	Earning (% change)	Indirect business taxes (% change)	Personal income taxes (% change)
Arizona	−1.049 (.0008)	−0.201 (.0004)	−0.048 (.0006)	−0.050 (.0004)
California	+16.751 (.0013)	+2.880 (.0007)	+0.521 (.0008)	+0.720 (.0007)
Colorado	−0.848 (.0006)	+0.850 (.0020)	−0.111 (.0020)	+0.213 (.0020)
Nevada	+7.014 (.0148)	+3.369 (.0164)	+0.582 (.0182)	+0.842 (.0164)
New Mexico	−12.273 (.0279)	−1.511 (.0110)	−0.586 (.0204)	−0.378 (.0110)
Utah	−3.628 (.0060)	−0.718 (.0039)	−0.281 (.0090)	−0.180 (.0040)
Wyoming	−0.359 (.0020)	−0.048 (.0008)	−0.023 (.0020)	−0.012 (.0008)
Basin	+6.470 (.0003)	+3.704 (.0006)	+0.136 (.0002)	+1.049 (.0006)

The projected impacts on the economies of various States ranged from about −$12.273 million in New Mexico to about +$16.751 million in California measured as annualized values (Table 1). However, projected negative impacts that could occur in the various State economies were so small when compared to the base economies that they are probably nonexistent, ranging from 0.0008 percent in Arizona to 0.0279 percent in New Mexico. Some States could experience small but positive impacts (e.g., California and Nevada).

Impacts on earnings, indirect business taxes, and personal income taxes are organized in the same way as those for output (Table 1). The conclusions expressed for output hold also for the earnings, indirect business taxes, and personal income taxes impacts (Brookshire et al. 1994).

Employment

Table 2 presents State and regional incremental impacts on employment over the 25-year period of the study. The values in the table represent the deviation in employment, measured as jobs, between the without fish and with fish scenarios. As with other aspects of the economy, employment impacts are both positive and negative both across States and over time. For New Mexico, the employment impact is approximately 2 jobs foregone in 1995 and this figure rises to 613 jobs foregone by the year 2020. On the other hand, for California there is a gain of approximately 20 jobs in 1995 and this positive impact increases to a projected 1,162 jobs by 2020. For the Basin as a whole, the employment impacts are positive through the study period. In 1995, the projected gain is approximately 60 jobs. By 2020, the gains in employment are projected to be approximately 393 jobs.

TABLE 2.— IMPACTS OF THE CRITICAL HABITAT DESIGNATION ON EMPLOYMENT IN EACH STATE AND THE COLORADO RIVER BASIN. EMPLOYMENT IMPACTS REPRESENT JOBS FOREGONE OR GAINED IN THE FUTURE THROUGH THE YEAR 2020. (AFTER BROOKSHIRE ET AL. 1994)

State	1995	2000	2005	2010	2015	2020
Arizona	−1.85	−4.68	−7.77	−12.08	−18.86	−25.83
California	+19.99	+92.57	+258.48	+475.86	+781.18	+1161.93

TABLE 2.— IMPACTS OF THE CRITICAL HABITAT DESIGNATION ON EMPLOYMENT IN EACH STATE AND THE COLORADO RIVER BASIN. EMPLOYMENT IMPACTS REPRESENT JOBS FOREGONE OR GAINED IN THE FUTURE THROUGH THE YEAR 2020. (AFTER BROOKSHIRE ET AL. 1994)—Continued

State	1995	2000	2005	2010	2015	2020
Colorado	+8.91	+5.16	−6.93	−19.69	−36.86	−55.60
Nevada	+34.86	+71.52	+108.03	+143.22	+177.25	+208.69
New Mexico	−2.17	−27.98	−110.71	−239.60	−415.21	−612.64
Utah	−10.91	−22.30	−34.56	−47.71	−61.06	−74.13
Wyoming	−0.40	−1.40	−2.41	−3.45	−4.35	−5.22
Colorado River Basin	+59.94	+116.15	+178.70	+230.02	+294.76	+392.67

National Economic Impacts

The results below are from the Computable General Equilibrium model and represent economic output for the Basin (Table 3). Although the projected national economic impacts were positive for all variables, there is almost no change in the regional economy.

TABLE 3.—RESULTS OF COMPUTABLE GENERAL EQUILIBRIUM MODEL FOR THE COLORADO RIVER BASIN. (AFTER BROOKSHIRE ET AL. 1994)

Variable	Economic impact	Percent change in economy
Regional Product	+$7.92 million	0.0013
Employment	+710 jobs	0.0047
Earnings	+$6.62 million	0.0017
Govt Revenue	+$3.20 million	0.0016

Exclusion Process

Background

Pursuant to section 4(b)(2) of the Act, critical habitat is designated by using the best scientific data available, and in full consideration of economic and other impacts of designation. The determination on whether to exclude a reach or portion of a reach considers: (1) The benefits of including that reach, (2) the benefits of excluding a reach, and (3) the effect of that reach, or the cumulative effect of excluding more than one reach, on the probability of species extinction. If the exclusion of a river reach or portion of a reach would result in the eventual extinction of a species, the exclusion is prohibited under the Act.

Exclusion of an area as critical habitat would eliminate the protection provided under the destruction or adverse modification provision of section 7 for critical habitat. However, it would not remove the need to comply with other requirements of the Act for that area, such as the "likely to jeopardize" prohibition of section 7 consultation (for Federal actions) and section 9 (take). Section 7 consultation requirements apply to Federal actions regardless of whether or not critical habitat is designated for a particular area.

The Service determined whether the benefits of inclusion of critical habitat areas would outweigh the benefits of their exclusion, by using five sequential steps:

Step 1—Identify areas that meet the definition of critical habitat in section 3(5) of the Act and that are considered essential to the conservation of the species. This was accomplished, and the areas needed for conservation were published in the proposed rule to designate critical habitat on January 29, 1993 (58 FR 6578). Justifications for these areas were presented in the Draft Biological Support Document, which was made available to the public on September 15, 1993 (58 FR 48351).

Step 2—Conduct an economic analysis to determine the anticipated economic consequences of designating areas as critical habitat. A draft report on the economic analysis was completed and made available to the public for comment on November 12, 1993 (58 FR 59979).

Step 3—Develop economic criteria or thresholds to help identify those areas that would be significantly affected by the critical habitat designation. Comments were requested from the public to aid in developing the criteria (November 12, 1993; 58 FR 59979).

Step 4—Compile the biological information that should be considered to determine whether excluding an area would result in extinction. Primary consideration was given to information contained in published recovery plans. The Service determined whether exclusion of an area will result in the extinction of a species.

Step 5—Conduct the exclusion process. The Service has evaluated which areas, if any, should be excluded due to economic or other relevant impacts. Prior to this evaluation, economic criteria in the form of thresholds (Step 3) were developed to provide a method by which the severity of economic impacts could be assessed. Those areas that exhibited economic impacts above the thresholds were then examined to determine if the biological threshold of extinction would be exceeded (Step 4) if the specific area in question was dropped from consideration as critical habitat.

Benefits and Costs of Designation

A public sector analysis examined the allocation of scarce resources regarding economic efficiency and distribution or equity (Brookshire et al. 1993, 1994). The efficiency criterion addressed whether designating areas as critical habitat produces greater net benefits than costs. The equity criterion looks at the resulting distribution of gains and losses. The Act requires the Service to protect threatened and endangered species for all citizens, now and in the future. This mandate falls under the national economic efficiency concern, where policy adjustments seek to minimize economic efficiency losses for society while preserving endangered species.

The Service does not have a mandated requirement to conduct an efficiency-based benefit-cost analysis when carrying out its resource protection activities. This is particularly true for species listing activities under the Act, where economic considerations are explicitly prohibited. During critical habitat designation, however, consideration of benefits and costs can occur when "economic and other relevant impacts" are specifically included as part of the process of final determination.

The economic analysis (Brookshire et al. 1994) only addressed market-related benefits and costs. No attempt was made to estimate nonmarket values associated with the preservation of the endangered fishes. However, the Service recognizes that the benefits of preservation are positive. The extant literature addressing the value of wildlife resources documents positive benefits for consumptive and nonconsumptive uses of wildlife species. The legislative history of the Act indicates that

Congress believed that the "worth" or value of a species is incalculable and invaluable. This is supported by the Supreme Court interpretation of the Act in *TVA* v. *Hill*, 437 U.S. 153, 178 (1978). This concept is applicable to the Basin as it represents one of the most distinctive collections of flora and fauna in North America.

The economic analysis and data used during the exclusion process addressed impacts to: river basin or sub-basin by State, each State as a whole, the region, and the Nation. Direct and indirect impacts on employment, wages, and State and Federal revenues from business and personal income taxes also were considered during the exclusion process.

Threshold of Significant Economic Impact

To establish the threshold for significant economic impact, impacts were evaluated in the context of the normal fluctuations of the economy (Brookshire et al. 1994). Over the period 1959–1991, the growth rate of the national economy (measured as percentage change in Gross Domestic Product) varied from −2.2 percent to 6.2 percent. The mean growth rate was 2.85 percent (with a standard deviation (SD) of 2.26 percent). Over the same period, the average unemployment rate was 5.95 percent (SD=1.52 percent). Impacts that lie within this range are within the normal fluctuations of the economy and are able to be absorbed by the economy. A conservative threshold for significant impacts would be a 1 percent SD from the projected baseline. If changes in employment or output due to critical habitat at a State level exceed this threshold, then that area of critical habitat should be considered for economic exclusion.

Various flow and nonflow impacts were evaluated in the economic analysis (Brookshire et al. 1993, 1994). Impacts associated with providing flows for fishes, including reoperation of mainstream dams, constituted the greatest monetary impacts. Flows in one reach may be dependent on the flows from reaches upstream. Therefore, even though a reach may be excluded for economic reasons, those economic impacts may not disappear due to downstream flow requirements of the fish. Thus, the smallest unit examined for economic impact was an individual river except for the mainstem Colorado River, which was by river reach.

Many of the critical habitat reaches were designated for more than one of the endangered fishes. Therefore, some reaches were needed for the eventual recovery of one species, and also needed to prevent extinction of another. The dual nature of many of the designated reaches and other issues made the exclusion process complex.

Conservation and Extinction as Factors in Designating Critical Habitat

The Act defines "conservation" to include the use of all means necessary to bring about the recovery of an endangered or threatened species. Section 7(a)(2) prohibitions against the destruction or adverse modification of critical habitat apply to actions that would impair survival and recovery of a listed species. As a result of the link between critical habitat and recovery, these prohibitions should protect the value of critical habitat until recovery. Survival and recovery, mentioned in the definitions of adverse modification and jeopardy, are conceptually related. The survival of a species may be viewed, in part, as a progression between extinction and recovery of the species. The closer a species is to recovery, the greater the certainty of its continued survival. The terms "survival" and "recovery" differ by the degree of confidence about the ability of a species to persist in nature over a given period.

Critical habitat consists of areas that contain elements that are essential to the conservation of a listed species. Critical habitat identifies areas that should be considered in the conservation effort and provides additional protection to those areas through section 7 consultation. Critical habitat is designated to contribute to a species' conservation; however, not all areas proposed as critical habitat may be necessary to prevent extinction. Consequently, some areas or portions of areas may be excluded due to economic considerations, provided that such exclusions would not result in the extinction of the species.

In its designation of critical habitat for the four Colorado River fishes, the Service has identified habitat required for recovery of each species and delineated reaches that contain habitat features needed for spawning, rearing, feeding, and migration. Species conservation is related to a number of factors, such as the number of individuals, the amount of habitat, the condition of the species and its habitat, the species' reproductive biology, and the genetic composition of the remaining populations. Through its previous efforts (e.g., section 7 consultation, research), the Service also has identified biologically important areas that still support these endangered fish. Additionally, important reaches have been identified in recovery plans for the Colorado squawfish, humpback chub, and bonytail chub. The Recovery Implementation Programs in the Upper Colorado River and San Juan River Basins have also identified essential reaches for these species. Although all areas proposed are important to conservation, those areas currently supporting the largest remaining populations may be key to the long-term survival of these species. Additionally, the physical and ecological relationships between these areas are an important consideration.

Extinction of the four Colorado River fishes would most likely occur as a result of the presence and continued introductions of nonnative fishes, significant changes in the hydrologic cycle, increased fragmentation and channelization of their habitat, and decreased water quality. Although a single action could result in extinction, the cumulative reduction in suitable habitat resulting from many actions also could lead to species extinction. Because these species are long-lived, the specific effects of some impacts are difficult to establish. Therefore, the exclusion analysis focuses not only on specific rivers and/or reaches, but also on their relationship to other reaches in evaluating whether or not extinction would be probable if a reach were excluded. Such factors as: (1) Current population status, (2) habitat quality (e.g., presence of spawning sites, nursery areas, and condition of the habitat), (3) geographical distribution of the populations, (4) genetic variability within the population, and (5) the relationship between critical habitat units were considered.

In order to determine river reaches required to prevent extinction (ensure survival) of these fishes, the Service relied upon available biological information and approved recovery plans. Information relating to the species' biological and ecological needs, such as habitat, reproduction, rearing, and genetics, was used in determining if an area was needed to prevent extinction of the species. Where enough information was available, specific recovery plans presented downlisting and delisting criteria. Downlisting criteria were generally equated to the survival level; delisting criteria were related to the recovery level. Because no recovery plan has been prepared for the razorback sucker, reaches required for its survival (downlisting) and recovery (delisting) may change as a recovery plan is developed by the Service and the Colorado River Fishes Recovery Team.

Exclusion

After considering the economic and other factors that may be pertinent to

any decision to exclude areas from designation as critical habitat, including information provided during the public comment period, the Service determined that no exclusions were justified due to economic and other relevant impacts.

Critical Habitat Designation

Critical habitat for each species is shown by State in Figure 1 and summarized in Table 4. The 100-year flood plain delineates the lateral boundary of the critical habitat for the razorback sucker and Colorado squawfish. This boundary encompasses the productive areas adjacent to the rivers, including the confluence of smaller tributaries and other habitats that provide essential fish habitat when inundated.

Figure 1. Map of combined critical habitat for the four Colorado River endangered fishes.

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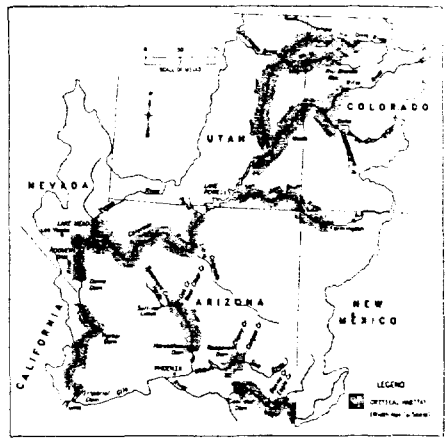

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TABLE 4.—RIVER KILOMETERS (MILES) OF CRITICAL HABITAT FOR FOUR ENDANGERED COLORADO RIVER FISHES

State	Razorback sucker	Colorado squawfish	Humpback chub	Bonytail chub	Total [1]
Colorado	349	583	95	95	583
	(217)	(362)	(59)	(59)	(362)
Utah	1107	1168	224	224	1172
	(688)	(726)	(139)	(139)	(728)
New Mexico	63	97	.....	.....	97
	(39)	(60)	.....	.....	(60)
Arizona	832	.....	291	.....	832
	(517)	.....	(181)	.....	(517)
AZ/Nevada	209	.....	.....	103	209
	(130)	.....	.....	(64)	(130)
AZ/California	214	.....	.....	80	294
	(133)	.....	.....	(50)	(183)
Basin Total [2]	2776	1848	610	502	3188
	(1724)	(1148)	(379)	(312)	[3] (1980)

[1] Total—Distances include all overlapping critical habitat reaches by State for all four Colorado River endangered fish.
[2] Basin Total—Distances include total extent of critical habitat by species for the entire Basin.
[3] Total Basin Total—Note that the sum of critical habitat by species is greater than actual river distance due to extensive overlap.

Razorback Sucker

The Service is designating 15 reaches of the Colorado River system as critical habitat for the razorback sucker. These reaches total 2,776 km (1,724 mi) as measured along the center line of the river within the subject reaches (Table 4). This represents approximately 49 percent of the historical habitat for the species. In the Upper Basin, critical habitat is designated for portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan Rivers. Portions of the Colorado, Gila, Salt, and Verde Rivers are designated in the Lower Basin. These reaches flow through a variety of landownerships, both public and private. The amount of critical habitat for the razorback sucker by landownership in kilometers of shoreline is presented in Table 5.

TABLE 5.—OWNERSHIP OF SHORELINE IN KILOMETERS (MILES) FOR CRITICAL HABITAT FOR THE ENDANGERED COLORADO RIVER FISHES [1]

Ownership [2]	Razorback sucker	Colorado squawfish	Humpback chub	Bonytail chub
NPS	1,955	900	545	676
	(1,215)	(559)	(338)	(420)
BLM	1,140	1,119	203	114
	(708)	(695)	(126)	(71)

TABLE 5.—OWNERSHIP OF SHORELINE IN KILOMETERS (MILES) FOR CRITICAL HABITAT FOR THE ENDANGERED COLORADO RIVER FISHES [1]—Continued

Ownership [2]	Razorback sucker	Colorado squawfish	Humpback chub	Bonytail chub
USFS	380 (236)	0	0	0
USFWS	159 (99)	35 (22)	0	40 (25)
Tribal	894 (555)	451 (280)	444 (276)	97 (60)
State Lands	63 (39)	79 (49)	1 (<1)	40 (25)
Private	960 (596)	1,112 (691)	27 (17)	37 (23)
Total	5,551 (3,448)	3,696 (2,296)	1,220 (758)	1,005 (624)

[1] The river distances shown in this table were compiled using total shoreline kilometers (assuming 1 kilometer of river centerline has 2 kilometers of shoreline) for each critical habitat reach. There is considerable overlap of critical habitat reaches between species; thus, total miles of designated critical habitat for all four Colorado River endangered fish cannot be obtained from this table.
[2] NPS—National Park Service; BLM—Bureau of Land Management; USFS—U.S. Forest Service; USFWS—U.S. Fish and Wildlife Service.

Colorado Squawfish

The Service designates six reaches of the Colorado River System as critical habitat for the Colorado squawfish. These reaches total 1,848 km (1,148 mi) as measured along the center line of each reach (Table 4). This represents about 29 percent of the historical habitat of this species. Critical habitat is designated in portions of the Colorado, Green, Yampa, White, and San Juan Rivers in the Upper Basin. There is no critical habitat designated for this species in the Lower Basin. The approximate number of shoreline miles of critical habitat by landownership for the Colorado squawfish is presented in Table 5.

Humpback Chub

The Service designates seven reaches of the Colorado River system as critical habitat for the humpback chub. These reaches total 610 km (379 mi) as measured along the center line of the subject reaches (Table 4). This represents approximately 28 percent of the historical habitat of the species. Critical habitat for the humpback chub is designated for portions of the Colorado, Green, and Yampa Rivers in the Upper Basin and the Colorado and Little Colorado Rivers in the Lower Basin. The approximate extent of critical habitat by landownership of shoreline for the humpback chub is presented in Table 5.

Bonytail Chub

The Service is designating seven reaches of the Colorado River system as critical habitat for the bonytail chub. These reaches total 499 km (312 mi) as measured along the center line of the subject reaches (Table 4). This represents approximately 14 percent of the historical habitat of the species. Critical habitat for the bonytail chub is designated for portions of the Colorado, Green, and Yampa Rivers in the Upper Basin and the Colorado River in the Lower Basin. The approximate extent of critical habitat for the bonytail chub is presented by landownership of shoreline in Table 5.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, local and private groups, and individuals. The Act provides for possible land and water acquisitions in cooperation with States and requires that recovery actions be carried out for all listed species. The requirements for Federal agencies with respect to protection of designated critical habitat of a federally listed species and prohibitions against taking are discussed below.

The Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (RIP) is a cooperative effort to recover the endangered fish in the Upper Basin (Green and Colorado Rivers only) while providing for water development to proceed in a manner compatible with applicable State and Federal laws. The RIP was implemented in January 1988 by a Cooperative Agreement signed by the Governors of Colorado, Utah, and Wyoming; the Secretary of the Interior; and the Administrator of the Western Area Power Administration. The process for conducting section 7 consultations on water projects was outlined in the RIP and further clarified by an October 15, 1993, final agreement on section 7 consultation.

The RIP provides the reasonable and prudent alternative to avoid the likelihood of jeopardy to the continued existence of the endangered fishes due to depletion impacts of new projects, and all existing or past impacts related to historical projects (with the exception of the discharge of pollutants by historical projects). Program participants also intend that the RIP will provide the reasonable and prudent alternative that will avoid the likely destruction or adverse modification of critical habitat currently being designated for the endangered fishes. A Recovery Action Plan (RIPRAP) that identifies specific actions and time frames needed to recover the endangered fishes was developed by the RIP. The RIPRAP will be used by the Service in determining if the RIP is achieving sufficient progress as a reasonable and prudent alternative to jeopardy. The RIP intends to analyze and amend the RIPRAP as appropriate, so that it can serve as the reasonable and prudent alternative to avoid the likely destruction or adverse modification of critical habitat. The Service considers that the RIP has made sufficient progress to serve as a reasonable and prudent alternative to jeopardy for projects that deplete less than 3.7 cubic hectometers (hm^3)(3,000 acre-feet). For projects depleting more than 3.7 hm^3 (3,000 acre-feet), the Service identifies actions in the RIPRAP that must be completed to avoid jeopardy.

As a result of reasonable and prudent alternatives to the Animas-LaPlata Project provided in the Biological

Opinion issued on October 25, 1991 by the Service, the Bureau of Reclamation agreed to fund 7 years of research and to develop a Recovery Implementation Program for the San Juan River. On October 24, 1991, a Memorandum of Understanding was signed by the Service, the Bureau of Reclamation, the Bureau of Indian Affairs, States of Colorado and New Mexico, the Ute Mountain Indian Tribe, the Southern Ute Indian Tribe, and the Jicarilla Apache Indian Tribe to set forth certain agreements and to establish a San Juan Recovery Implementation Program (SJRIP). The SJRIP provides the basis for the recovery of the endangered fishes of the San Juan River.

The 7-year research effort focuses on observing the biological response of endangered fish populations to habitat conditions after the reoperation of Navajo Dam to meet the needs of the Colorado squawfish and razorback sucker. The recovery elements define the major categories of activities that will be conducted to recover endangered fish species and maintain the native fish community in the San Juan River Basin. Intensive studies are being conducted by the SJRIP to determine the relative abundance and distribution of endangered fishes and other native and nonnative fishes. Modification and loss of habitat, fish poisoning, and nonnative fishes have contributed to the decline of the Colorado squawfish and razorback sucker in the San Juan River Basin. Regulating structures, such as Navajo Dam, can be operated to control river flow and temperatures to affect the quantity and quality of habitats in certain river reaches during periods when they are most critical to endangered fish species. After determining appropriate flow needs, the Biology Committee of the SJRIP, with input from the Bureau of Reclamation, will recommend specific flow regimes to the Service. It is anticipated that the water for habitat improvement will be provided by the reoperation of Navajo Dam.

The Bureau of Reclamation has agreed that it will operate Navajo Dam to provide a more natural hydrograph, if the research shows this type of hydrograph is beneficial to recovery of endangered species and the native fish community. If habitat and flow needs are identified that cannot be met by reoperation of Navajo Dam, additional sources of water to meet those needs will be identified on a case-specific basis. The success of the SJRIP is contingent upon the legal protection of water released for habitat flows pursuant to Federal, State, and tribal laws.

To date, 15 years of research and $18 million have been spent in fish stocking and research on these fish species in the Lower Basin. A combined research and management effort continues in the Lower Basin. This effort involves researchers from Arizona State University, Arizona Game and Fish Department, Nevada Department of Wildlife, California Fish and Game Department, Bureau of Reclamation, Bureau of Land Management, and the Service. These groups are currently developing protected grow-out areas in lakes Mohave and Havasu for razorback sucker and bonytail. To date, this effort has shown great potential. Additionally, there was a 10-year effort to restore razorback suckers and Colorado squawfish into the Gila River drainage.

An extensive research program has been initiated as part of the Glen Canyon Environmental Studies (GCES) to determine life history and ecology of the humpback chub in the Grand Canyon. The humpback chub was one of the initial species listed under the Act. In 1978, the Service issued a jeopardy Biological Opinion on the existing operation of Glen Canyon Dam, but needed further research to determine what actions are needed to benefit the listed fish. At that time, limited information existed on the distribution, abundance, life history, and habitat use for the Grand Canyon populations in the Colorado River mainstem and its associated tributaries. The inception of these studies is an outcome of the initial GCES/Phase I effort and Service conservation measures developed as part of long-term recovery effort for the species. The research program involves a coordinated effort among four principal entities (Arizona State University, Arizona Game and Fish Department, Bureau of Reclamation, and the Service), each addressing specific study objectives. This program is part of the short-term experimental research for the Glen Canyon Dam Environmental Impact Statement. A commitment to a long-term research and monitoring program exists and will function as a conduit for the culmination of additional information generated through the endangered species research.

Relationship of Critical Habitat to Other Provisions of the Act

Introduction

The purpose of the Act, as stated in section 2(b), is to provide a means to conserve the ecosystems upon which endangered and threatened species depend, and to provide a program for the conservation of listed species. Section 2(c)(1) of the Act states that "* * * all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." Conservation requirements of species listed as endangered or threatened under the Act include recovery actions, requirements for Federal protection, and prohibitions against certain practices.

The Act provides for the conservation of listed species through several mechanisms, such as section 5 (land acquisition); section 6 (Federal grants to States, and research); section 7 (requiring Federal agencies to further the purposes of the Act by carrying out conservation programs, and insuring that Federal actions will not likely jeopardize the continued existence of the listed species or result in the destruction or adverse modification of critical habitat); section 9 (prohibition of taking of listed species); and section 10 (permits for scientific purposes or to enhance propagation and survival of listed species and habitat conservation planning on non-Federal lands).

Critical habitat designation is primarily intended to identify the habitat needed for survival and recovery. Such designation is not a management or conservation plan, and designation of critical habitat does not offer specific direction for managing habitat. That type of direction, as well as any change in management priorities, will come through the administration of other parts of the Act (e.g., section 7, section 10 permit process, and recovery planning) and through development of management plans for specific species or areas. However, the designation of critical habitat in an area can result in additional protection for that area through administration of section 7 of the Act.

Recovery Planning

Recovery plans developed under section 4(f) of the Act guide much of the Service's recovery activities and promote conservation and eventual delisting of species. Recovery plans address the steps needed to recover a species throughout its range and provide a mechanism for implementation. Recovery plans provide guidance, which may include population goals, and usually include identification of areas in need of protection or special management. Recovery plans can include management recommendations for areas proposed or designated as critical

habitat. Recovery plans for the Colorado River endangered fishes may be modified to include specific recommendations for managing critical habitat. A recovery plan is not a regulatory document, but a plan may identify recommendations for implementing actions and managing critical habitat on Federal lands, and considerations for management of critical habitat on other land.

In compliance with section 7(a)(1) of the Act, Federal agencies should incorporate recommendations and goals provided within recovery plans for these species into land and water management plans. Biologically sound plans offer opportunities for resolving conflicts between development interests and endangered species conservation and provide a basis for present and future management decisions. Valid and acceptable management prescriptions contained in land and water development plans can help guide the Service and other agencies in managing critical habitat for the Colorado River endangered fishes and other listed and nonlisted species.

Section 7 Consultation

Section 7(a)(2) of the Act applies only to Federal agencies and requires them to insure that activities they authorize, fund, or carry out are not likely to destroy or adversely modify critical habitat. This Federal responsibility accompanies, and is in addition to the requirement in section 7(a)(2) of the Act that Federal agencies insure that their actions are not likely to jeopardize the continued existence of any listed species. Jeopardy is defined in the section 7 regulations (50 CFR 402.02) as any action that would be expected to appreciably reduce the likelihood of survival and recovery of a species in the wild by reducing its numbers, reproduction, or distribution. Destruction or adverse modification of critical habitat is defined at 50 CFR 402.02 as a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. The regulations also state that such alterations include, but are not limited to, alterations destroying or adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical. The requirement to consider potential adverse modification of critical habitat is necessary and in addition to the review necessary to evaluate the likelihood of jeopardy in a section 7 consultation.

As required by 50 CFR 402.14, a Federal agency must consult with the Service if one of its actions may affect either a listed species or its critical habitat. Federal action agencies are responsible for determining whether or not to consult with the Service. The Service will review agencies' determinations on a case-by-case basis and may or may not concur with the agencies' determination of "no effect" or "may affect" for critical habitat, as appropriate. Section 7 consultation is initiated by a Federal agency when its actions may affect critical habitat by impacting any of the primary constituent elements or reduce the potential of critical habitat to develop these elements. The consultation also would take into consideration Federal actions outside of critical habitat that also may impact a critical habitat reach (e.g., water management, water quality, water depletions, and nonnative fish stocking or introductions). Though a Federal action may not destroy or adversely modify critical habitat, it still may affect one or more of the Colorado River endangered fishes and their habitat and could be subject to consultation under section 7 of the Act to determine the likelihood of jeopardy to the species.

A number of Federal entities fund, authorize, or carry out actions that may affect areas the Service has designated as critical habitat. Among these are the Western Area Power Administration, Federal Energy Regulatory Commission, Fish and Wildlife Service, Bureau of Land Management, National Park Service, Bureau of Indian Affairs, Bureau of Mines, Bureau of Reclamation, Forest Service, Corps of Engineers, Army, Air Force, Environmental Protection Agency, Housing and Urban Development, Federal Emergency Management Agency, and Federal Highway Administration.

Basis for Section 7 Analysis

Designation of critical habitat focuses on the primary constituent elements within the defined areas and the contribution of these elements to the species' recovery, based on consideration of the species' biological needs and factors that contribute to survival and recovery. The evaluation of actions that may affect critical habitat for the Colorado River endangered fishes should consider the effects of the action on any of the factors that were the basis for determining the habitat to be critical. These include the primary constituent elements of water, physical habitat, and biological environment, as well as the contribution of the reach and the local sites to recovery. The desired outcome of section 7 compliance should be to avoid further reductions in the capability of the habitat to support Colorado River endangered fishes (e.g., the type of activities that led to listing, such as depletions, predation, competition, fragmentation, and habitat degradation).

For wide-ranging species, such as the Colorado River endangered fishes, where multiple critical habitat reaches are designated, each reach has a local and a rangewide role in contributing to the conservation of the species. The loss of a single piece of habitat may not jeopardize the continued existence of the species, but it may reduce the ability of critical habitat to contribute to recovery. In some cases, the loss of a site containing a primary constituent element could result in local population instability. This could have a detrimental effect on the reach or that portion of the reach where the loss occurred and could preclude recovery or reduce the likelihood of survival of the species. Each critical habitat reach is dependent upon conditions in adjacent reaches, whether or not those reaches were designated critical habitat. Consideration must therefore be given to Federal actions that would take place both within and outside of a critical habitat reach. Degradation of a critical habitat reach, regardless of the source of that degradation, may impact the survival and recovery of the species.

The level of disturbance a particular critical habitat reach could withstand and still fulfill its intended purpose is variable for each species and each area of the Basin. Any proposed activity will need to be reviewed in the context of affected species, habitat condition, and project location. Because of the habitat overlap among these species, it may be difficult to completely separate out the effects of a particular action on any one species.

The designation of seasonally unoccupied habitat to provide for the conservation (recovery) of a listed species adds another dimension to the analysis. Because listed species are not always present in these habitats, it may not be possible to reach a "jeopardy" finding for actions affecting that habitat. However, it may be possible to conclude "destruction or adverse modification" for a species if designated critical habitat is affected and its value for conservation of the species is diminished.

Examples of Proposed Actions

For any final regulation that designates critical habitat, section 4(b)(8) of the Act requires a brief description and evaluation of those activities (public or private) that may

adversely modify such habitat or may be affected by such designation. Destruction or adverse modification of critical habitat is defined as a direct or indirect alteration that appreciably diminishes the value of critical habitat for both survival and recovery of a listed species. Some activities may disturb or remove the primary constituent elements within designated critical habitat for the Colorado River endangered fishes. These activities may include, among others, actions that would reduce the volume and timing of water, destroy or block off spawning and nursery habitat, prevent recruitment, adversely impact food sources, contaminate the river, or increase predation by and competition with nonnative fish. In contrast, other activities may have no effect on the critical habitat's primary constituent elements. Activities such as recreation (boating, hiking, hunting, etc.), some types of farming, and properly managed livestock grazing may not adversely modify critical habitat.

Areas designated as critical habitat for the Colorado River endangered fishes support a number of existing and proposed commercial and noncommercial activities. Some of the commercial and governmental activities that may destroy or adversely modify critical habitat include construction and operation of hydroelectric facilities, irrigation, flood control, bank stabilization, oil and gas drilling, mining, grazing, stocking or introduction of nonnative fishes, municipal water supplies, and resort facilities. Commercial activities not likely to destroy or adversely modify critical habitat include nonconsumptive activities such as river float trips, guided sport fishing, and excursion boat tours. Noncommercial activities are largely associated with private recreation and are not considered likely to adversely affect critical habitat. Such activities include boating, fishing, and various activities associated with nature appreciation. However, it must be emphasized that section 7 of the Act only applies to Federal actions (projects, permits, loans, etc.) and that each Federal action must be evaluated on a case-by-case basis.

Some activities could be considered a benefit to Colorado River endangered fishes habitat, such as the Colorado River and San Juan River Recovery Implementation Programs and, therefore, would not be expected to destroy or adversely modify critical habitat. Examples of activities that could benefit critical habitat in some cases include protective measures such as instream flow protection, development of backwater or cove habitat that benefits native species, or eradication of nonnative fish. However, these activities should be evaluated on a case-by-case basis.

Federal actions related to fisheries management in general require close evaluation by the Service. The introduction or stocking of nonnative fish may require evaluation under section 7 for both the jeopardy and adverse modification standards and to determine whether it would constitute taking under section 9. Although the significance of predation on eggs, larvae, and juvenile endangered fish species by nonnative fish has not been quantified throughout the Basin, this impact has been documented for many species of endangered fishes in the Basin and is considered a key factor in their decline. Nonnative fishes may have other effects on individual fish and critical habitat through competition, changes in habitat, and incidental mortality.

Endangered fish research and management activities are likely to affect individual fish or improve the quality and usefulness of habitat for the endangered fishes. These types of activities are addressed through the section 10 permit process, which includes a section 7 evaluation to determine the effects of the action.

Reasonable and Prudent Measures

In cases where destruction or adverse modification is indicated (with or without the likelihood of jeopardy), a portion of the economic impacts may result from complying with terms and conditions in the incidental take statement of a Biological Opinion. An incidental take statement is provided in a biological opinion if the Service anticipates incidental loss of individuals of the species as a result of habitat alteration resulting from a Federal action. The incidental take statement outlines the number of individuals and/or amount of habitat the Service anticipates will be lost due to the Federal action. The Service then identifies reasonable and prudent measures necessary to minimize such take and sets forth terms and conditions that the Federal agency and/or applicant must comply with to implement the reasonable and prudent measures. In some cases, the requirements to minimize incidental take (terms and conditions) may be similar to reasonable and prudent alternatives developed under an adverse modification or jeopardy finding.

Reasonable and Prudent Alternatives

If the Service concludes in a biological opinion that an action would likely result in the destruction or adverse modification of critical habitat, the Service is required to provide reasonable and prudent alternatives, if any, to the proposed action in its biological opinion. By definition, reasonable and prudent alternatives allow the intended purpose of the proposed action to go forward while avoiding the conditions that would adversely modify critical habitat. To increase the potential for identifying such alternatives, the Service recommends that the agencies initiate discussions early in the planning process before plans have advanced to the point where alternatives may not be as feasible. If discussions are initiated early, more opportunities to reduce impacts may be available. If an adverse modification was anticipated, examples of possible reasonable and prudent alternatives provided in a biological opinion include those noted in Table 6.

TABLE 6.—EXAMPLES OF POSSIBLE REASONABLE AND PRUDENT ALTERNATIVES

Example Alternatives
Relocate the proposed activity to another location within or outside of critical habitat to avoid destruction or adverse modification of habitat.
Modify the project (physically/operationally) to avoid adverse modification of critical habitat.
Provide offsetting measures to either Colorado River endangered fishes or the critical habitat area by actions such as: A. acquiring water or securing water rights for Colorado River endangered fishes from other sources to offset a proposed depletion; B. implementing water conservation measures so that no net loss of water occurs; C. enhancing constituent element areas so that a net benefit to Colorado River endangered fishes occurs, i.e., acquiring bottom lands and removal or large-scale reductions of nonnative fish within a critical habitat reach; or D. undertaking other recovery actions identified in recovery plans, Recovery Implementation Programs, or other approved management plans or activities.

Some reasonable and prudent alternatives may only require minor modifications to construction and/or operational plans. As an example, a proposed boat ramp may need to be relocated a short distance to avoid impacting a spawning or nursery area. Projects resulting in more significant impacts may require major changes to the original proposal. A large irrigation diversion project, as an example, may be likely to affect most of the constituent elements of a critical habitat reach and

also impact adjacent and downstream reaches. The Service may recommend reduction in the scope of the project, seasonal timing constraints on depletions and operation, and reservoir releases to provide required instream flows.

Expected Impacts of Designation

The Service anticipates that the factors described in this rule and the Draft Biological Support Document will be used as a basis for determining the environmental impacts of various activities on critical habitat. The Service also will use Recovery Action Plans developed within the Recovery Implementation Programs of the Upper Basin and the San Juan River Basin and recovery plans for the razorback sucker (when developed), Colorado squawfish, humpback chub, and bonytail chub during consultation to evaluate actions within a critical habitat reach. The Service also will use new information as it becomes available.

Federal actions proposed in critical habitat reaches may or may not adversely modify critical habitat, depending on the current condition of the area and the degree of impact anticipated from implementation of the project. The potential level of allowable impacts or habitat reduction in critical habitat reaches will be determined on a case-by-case basis during section 7 consultation.

Summary of Public Comment

The Service published the proposed rule to designate critical habitat on January 29, 1993 (58 FR 6578). At that time, the Service requested comments on all aspects of the proposal including the scope of impacts and benefits of the designation. A public comment period was opened from January 29, 1993, to March 30, 1993. On March 5, 1993, the public comment period was extended to April 15, 1993 (58 FR 12573). During this initial 75-day comment period, 686 written or oral comments were received by the Service. During the comment period, the Service held public hearings on the proposed rule at San Bernardino, California, on March 29, 1993; Phoenix, Arizona, on March 30, 1993; and Denver, Colorado, on March 31, 1993. In addition to the announcement of the public hearings in the **Federal Register** (58 FR 12573), notices were published in the following newspapers: Wyoming—Casper Star-Tribune; Colorado—Denver Post, Rocky Mountain News, Northwest Colorado Press, Grand Junction Daily Sentinel, Durango Herald; Utah—Salt Lake Tribune, Deseret News, Ogden Standard-Examiner, Sun Advocate, Moab Times-Independent, Vernal Express, Southern Utah News; Arizona—The Arizona Republic, Today's Daily News, Eastern Arizona Courier, Arizona Daily Sun, Lake Powell Chronicle, Yuma Daily Sun; New Mexico—Farmington Times, Santa Fe New Mexican, Albuquerque Journal; Nevada—Las Vegas Review Journal; California—San Diego Union Tribune and San Bernardino Sun.

On September 15, 1993, the Service released the Draft Biological Support Document to the public for comment (58 FR 48351). The comment period on the proposed designation was reopened. On November 12, 1993, the Service published a notice announcing the availability of the Economic Analysis, the Overview Document, the closing date for public comment, a request for information to be used during the exclusion process and development of economic exclusion criteria, and the dates and locations of additional public hearings (58 FR 59979). The public comment period on the proposed rule, the Draft Biological Support Document, and the Economic Analysis ended on January 11, 1994. Public hearings were held on: November 29, 1993, in Salt Lake City, Utah, and Las Vegas, Nevada; November 30, 1993, in Cheyenne, Wyoming, and Globe, Arizona; December 1, 1993, in Grand Junction, Colorado, and Flagstaff, Arizona; December 2, 1993, in Farmington, New Mexico; and December 3, 1993, in San Bernardino, California. In addition to the announcement in the **Federal Register** and notices in newspapers, a letter was sent to all interested parties announcing the dates of the public hearings and January 11, 1994, as the closing date for public comment. During this comment period 399 written or oral comments were received. Issues presented by the public during the comment periods are discussed below.

Economic and biological information received during the comment periods was reviewed and considered. In cases where the information or data provided was determined to be valid, changes were made in the economic analysis or to the boundaries of the critical habitat designation. Significant economic data received from the public were incorporated into the economic models prior to the exclusion process. Many economic comments received were used to improve the accuracy and readability of the Economic Analysis.

Of the 1,085 written and oral statements received during the public comment periods, 599 were form letters that provided little additional information on the proposed designation. Fifty respondents stated their support for the critical habitat designation, 947 expressed their opposition, and the remainder were neutral. A summary of the issues brought forth from these comments and the Service's response is provided below.

Administrative Issues

Issue 1: Numerous respondents stated that the comment period for the Draft Biological Support Document, Overview Document, and Economic Analysis was not of sufficient length to allow adequate review; respondents suggested 120 days or more for adequate review. Respondents suggested that public hearings should be held in more locations including all areas potentially impacted by the proposed designation.

Service Response: On any proposal to designate critical habitat, the Service is required to provide a minimum comment period of 60 days. When a comment period is reopened, it is generally for up to 30 days. The Service opened a 60-day comment period on the proposed rule to designate critical habitat for the four endangered Colorado River fishes. The comment period was extended for an additional 15 days.

Because the Draft Biological Support Document and Economic Analysis were not complete at the time of the proposed rule, the Service reopened the comment period for an additional 60 days rather than the more usual 30 days. Therefore, in total the comment period was 192 days. A longer comment period was not possible because of the court order to publish a final rule by March 15, 1994.

Three public hearings were held after publication of the proposed rule, and an additional eight public hearings were held to receive comment on the proposal including the economic analysis; one in each of the seven Basin States and an additional hearing in Arizona. Any additional hearings would not have met fiscal and time constraints of the critical habitat designation.

Issue 2: A few respondents suggested that the Service publish a revised proposed rule to allow for additional public comment before making a final decision or that the Service should prepare a draft final rule and make that available to the public before finalizing the critical habitat designation.

Service Response: The standard rulemaking process requires preparation of a proposed rule followed by a final rule. Publishing a revised proposed rule or a draft final rule is not required unless revisions are necessary that will result in an increased regulatory burden in the revised rule. Furthermore, on November 19, 1993, the Court directed the Service not to publish an interim

final rule. Publishing the Draft Biological Support Document and Economic Analysis for public comment provided additional opportunities for public involvement. All comments received on the Draft Biological Support Document and the Economic Analysis were analyzed, considered, and where appropriate those comments were considered during the exclusion process and included in the final rule.

Issue 3: Some respondents questioned whether critical habitat should have been proposed without first completing the biological and economic analyses and stated that it was difficult to comment on the proposed rule until these documents were made available to the public.

Service Response: Designation of critical habitat normally would have allowed preparation of the Draft Biological Support Document and Economic Analysis prior to publishing the proposed rule. The Service argued in court that the biological support information and economic analysis should be completed for release with the proposed rule. However, a court order compelled the Service to focus exclusively on development of the proposed rule. The Service recognized that the sequence would make substantive comments on the proposed rule difficult to prepare. For this reason the Service provided an Overview, a Draft Biological Support Document, and an Economic Analysis for public review and comment prior to preparation of a final rule. The Service considered all public comments on these documents and the proposed rule during the exclusion process and final rule preparation.

Issue 4: Many respondents stated that the Service should prepare an Environmental Impact Statement (EIS) and comply with the National Environmental Policy Act (NEPA) because the designation would have significant impact on the human environment.

Service Response: The United States District Court for the District of Oregon in *Douglas County* v. *Manuel Lujan* (Civil No. 91–6423–HO) ruled that critical habitat designations should be analyzed under NEPA. However, such decision is stayed pending appeal to the Ninth Circuit.

The 1981 Sixth Circuit Court decision in *Pacific Legal Foundation* v. *Andrus* (657 F.2d 829) held that an EIS is not required for listings under the Act. The decision noted that preparing an EIS on a listing action would not further the goals of NEPA or the Act. The Service believes that the reasoning behind this decision is sound and that preparing an EIS on the proposed critical habitat designation would not further the goals of NEPA or the Act. The NEPA documentation should be done on management plans and activities that involve critical habitat; section 7 consultation is conducted on those actions. Additionally, the Service believes that the Draft Biological Support Document and Economic Analysis provide the public and decision makers the same information that is generally supplied in a NEPA document (environmental impact statement or environmental assessment).

Issue 5: Many respondents were concerned that critical habitat designation would result in "takings" of water rights and other private property.

Service Response: The Service prepared a "Takings Implications Assessment" under provisions of Executive Order 12630 to address this issue. The Service has concluded that the promulgation of the rule designating critical habitat will not take water rights or other private property. Although there may be cases where land or water use may be conditioned, it is unlikely that use would be prohibited. Moreover, the Service does not anticipate any takings implications associated with other Federal agency actions resulting from the designation and if there were to be any, it is unlikely that they would be significant.

Issue 6: Tribal representatives stated that tribal lands are sovereign and therefore should not be designated.

Service Response: The Endangered Species Act of 1973, as amended, applies to any entity or individual subject to the jurisdiction of the United States. No area or entity within the boundaries of the United States is exempt from the Act. The Act requires that the Service base designation of critical habitat on the best scientific information, taking into consideration economic and other relevant impacts, and that areas be excluded only if the benefits of exclusion outweigh the benefits of inclusion. The Act does not provide for categorical exemption of tribal lands from critical habitat designation, or other provisions, when scientific studies indicate the lands contain important habitat. Section 9 prohibits take of listed fish or wildlife on private and tribal lands, including destruction of habitat that results in the take of such wildlife. Section 7 applies to any Federal agency that authorizes, funds or carries out actions that are likely to jeopardize the continued existence of a species or destroy or adversely modify critical habitat. This includes Federal actions involving tribal lands that may affect critical habitat.

Issue 7: Representatives of tribal governments stated that designating critical habitat on tribal lands violates the Federal Government's trust responsibility.

Service Response: As stated above, the Endangered Species Act of 1973, as amended, applies to all areas of the United States, including tribal lands. The Service does not agree that inclusion of tribal lands violates the Federal Government's trust responsibility. Mere designation of critical habitat does not affect tribal lands unless a Federal action is likely to destroy or adversely modify critical habitat. The requirement to consider adverse modification of critical habitat is an incremental section 7 consideration above and beyond review to evaluate jeopardy and incidental take of the species. The Service will work with tribes to develop reasonable and prudent alternatives for any adverse modification finding and to live up to the Federal Government's trust responsibility and to maintain compliance with the Act.

Issue 8: Several respondents stated that critical habitat should not be designated until a recovery plan is completed for the razorback sucker.

Service Response: The Act requires that critical habitat be designated concurrently with a species' listing or within 2 years of the proposal to list the species. Only if the Service determines that identification of critical habitat is "not prudent" (i.e., will not be of net benefit to the species) is designation not required by the Act. The Service has determined that critical habitat for these species is determinable and that designation is prudent. The Service proposed listing of the razorback sucker on May 22, 1990 (55 FR 21154); therefore, the designation of critical habitat for this species should have been completed by May 22, 1992. The Act also requires the Service to prepare a recovery plan for any listed species likely to benefit from one; although no timeframe is mandated, Service policy provides that such plans shall be completed within 30 months following listing. Therefore, the timeframes imposed by the Act usually necessitate the designation of critical habitat before a recovery plan can be approved. Finally, the Court has ordered designation by March 15, 1994.

Issue 9: A few respondents suggested that critical habitat should only have been designated for the razorback sucker and not for all four species at the same time.

Service Response: The Service was ordered by the Court to designate critical habitat for the razorback sucker

with no mention of the other three endangered Colorado River fish. However, because the intent of the Act is "* * * to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved * * *," the Service also decided to propose critical habitat for the Colorado squawfish, humpback chub, and bonytail chub. These fishes coexist in the Basin and much of their habitats overlap. However, for species that do not have a requirement to designate critical habitat, the Service may designate critical habitat at any time. The designation of critical habitat for four species in a single rule is more cost- and time-effective than designating critical habitat separately for each species.

Issue 10: The public believed that they should be more involved in the decision process and suggested that workgroups be established to designate critical habitat that involved affected groups.

Service Response: Through comments provided on the proposed rule, Draft Biological Support Document, and Economic Analysis, the public provided information considered by the Service in the decision process. The Service, acting through its economic contractors, obtained additional information from affected groups needed to complete the Economic Analysis. The process of asking for comments and holding hearings is the Service's standard procedure for involving the public in decision making regarding listing of species and designation of critical habitat.

Issue 11: Various groups involved in recovery efforts for the four fishes asked how critical habitat will relate to existing RIP's.

Service Response: Critical habitat is an inventory of habitat needed for survival and recovery and not a plan providing goals or guidance toward achieving recovery. The Recovery Implementation Programs for the Colorado and San Juan Rivers (RIP's) have, as their goal, recovery of these four fish species. Therefore, the designation of critical habitat is not in conflict with the stated goal of the RIP's. It is the intent of the Service that recovery actions under the auspices of the RIP's will serve as reasonable and prudent alternatives to adverse modification.

Issue 12: A few respondents believed that the designation included so much area that it would not be manageable.

Service Response: The Service's designation includes many miles of the Basin's major rivers covering the areas needed for the survival and recovery of the species involved. Extensive areas are required to meet all the life history requirements of these four fishes.

Issue 13: A few respondents stated that critical habitat designation is not "prudent and/or determinable."

Service Response: On October 27, 1992, the Court ruled that the Service had violated the Act in failing to designate critical habitat when the razorback sucker was listed. The Court ordered the Service to have a proposed rule designating critical habitat for the razorback sucker published by January 25, 1993, using presently available information and to have a more complete final rule published at the earliest time permitted by the Act and its regulations.

The language in the Act and Service regulations at 50 CFR 424.12 for determining prudency indicate that unless the designation will not be of net benefit to the species, it is prudent to designate critical habitat. If the Service finds that critical habitat is not determinable at the time, then it must collect the information needed to determine it and complete designation within 2 years of the proposed listing. The Service has determined that designation in this situation is both prudent and determinable.

Issue 14: Many respondents questioned the effect of critical habitat on existing water laws, compacts (including compact entitlements), treaties, etc., and indicated that the Service had ignored the "Law of the River."

Service Response: Critical habitat designation for the four fishes does not modify or nullify any existing State water law, compact agreement, or treaty. It is the Service's opinion that the Act, as well as other Federal statutes, are part of what is commonly referred to as the "Law of the River". Impacts to water development opportunities within any State are adequately addressed in the Economic Analysis.

It is the intent of the Service to fully consider State water law, interstate compact agreements, and treaties in protecting and recovering the four endangered fishes. As an example, the Service has worked to establish and to support the Upper Colorado River and San Juan River Recovery Implementation Programs, whose participants have committed to recover the four endangered fish consistent with State water laws and other agreements.

Issue 15: A few respondents believe that the economic impacts of listing the Colorado River fishes as endangered should be accounted for in the economic analysis as impacts of designating critical habitat.

Service Response: The listing of a threatened or endangered species is considered a different action than determination of critical habitat. At the time of listing, the Service considered biological factors in determining to list the four species as endangered. Regarding critical habitat, section 4(b)(2) of the Act places requirements on the Secretary to consider the economic impact and any other relevant impact of specifying any particular area as critical habitat. Economic impacts that result from other requirements of the Act that are distinct from critical habitat designation are not required to be considered during the economic analysis for critical habitat.

Issue 16: Some respondents were concerned the Service did not seek adequate consultation with affected groups.

Service Response: The Service provided all interested groups as much time to comment on the proposed designation as Court orders allowed. The timeframes required that existing information be used to develop the economic impact model. Economic information has been obtained from existing sources and also was requested at the time of publication of the proposed rule, Draft Biological Support Document, and the Economic Analysis.

Issue 17: Some individuals believed that private property should not be included in the designation.

Service Response: The Endangered Species Act applies to all areas within the United States and contains no biological or legal justification for the categorical exclusion of private lands from critical habitat designation. The Service designated critical habitat based on biological information regarding whether or not an area contains the primary constituent elements for critical habitat for the four fishes, after taking into account the economic costs associated with the critical habitat designation. Critical habitat designation only impacts private property if there is an action by a Federal agency (permit, funding or other action) that is likely to destroy or adversely modify critical habitat. The requirement to consider adverse modification of critical habitat is an incremental section 7 consideration above and beyond section 7 review to evaluate jeopardy and incidental take of the species.

Issue 18: A few agencies were concerned that critical habitat designation will increase administration/implementation costs of doing section 7 consultation.

Service Response: Section 7 consultation is already being done on all Federal projects and other activities in

river reaches proposed for designation as critical habitat, because all reaches are occupied by the endangered fishes. Many of the effects of designation on the physical and biological features of the habitat are already considered in the analysis of effects of the action to determine if the project is likely to jeopardize the continued existence of the species. For most projects, the additional analysis required to determine destruction or adverse modification of critical habitat would be small and would not significantly increase existing workloads.

Issue 19: Several respondents stated that the Service was in violation of the Endangered Species Act (Act) for designating critical habitat more than two years after species, and the Federal Land Policy Management Act (FLMA) for failure to comply with required procedures in implementing a major management action.

Service Response: On October 27, 1992, the Court ruled that the Service was in violation of the Act because critical habitat had not been designated concurrently with the listing of the razorback sucker. This designation of critical habitat for the Colorado River endangered fishes brings the Service into full compliance with the requirements of the Act. In addition, the Service has followed procedural requirements for the designation. The Act does not stipulate that critical habitat cannot be designated after the initial two year period has passed.

Designation of critical habitat is not a management action under the FLPMA, but an action required by section 4 the Act. Actions authorized, funded or carried out by Federal agencies must undergo section 7 consultation if they may affect a listed species or critical habitat. The Service will determine if such actions are likely to jeopardize the continued existence of these four endangered fishes or destroy or adversely modify their critical habitat. Plans developed under FLPMA would be subject to section 7 consultation if it is determined that the action may affect the endangered fishes or their habitat. Because the designation of critical habitat does not by itself create a management plan or automatically exclude certain activities, FLPMA does not apply to designation.

Issue 20: One respondent believed that providing a comment period after the Draft Biological Support Document/ Economic Analysis was made available did not allow for meaningful public comment on the rule.

Service Response: While the Service would have preferred that the Draft Biological Support Document and Economic Analysis be available to the public at the time the proposed rule was published, that was not possible because of the Court's order. Although not released concurrently with the proposed rule, the two documents were written to support it, and comments were requested on these documents and considered in the exclusion process and in preparation of the final rule.

Issue 21: Several letters requested that the Service provide for public comment on the balancing/exclusion process, including holding additional public hearings.

Service Response: The exclusion process is conducted immediately prior to preparing a final rule and does not provide for any additional public input. All available information is used in the exclusion process. This includes information obtained during the public comment period. Additional information supplied during the public comment period could change the economic costs to certain areas or provide additional biological information as to the significance of an area to the species. Information relating to the Exclusion Process was provided in the "Overview of the Critical Habitat Designation for the Colorado River Endangered Fish: Draft" published November 1993 (Fish and Wildlife Service, Salt Lake City) and made available to the public (58 FR 59979). That document stated that "* * * information and comments are welcome on the overall exclusion process, recommendations on economic criteria for use in the exclusion determination, any other benefits associated with exclusion, benefits of including proposed areas as critical habitat, and information on which areas, if excluded, would result in the extinction of any of the four endangered fishes."

Issue 22: A few respondents stated that there are no economic impacts from listing; therefore, all impacts associated with having endangered fish in the Basin should be attributed to critical habitat.

Service Response: Once a species is listed as endangered or threatened, protections under sections 7 and 9 of the Act come into force. Section 7 protections are based on the provisions in the Act that require all Federal agencies to insure that their actions do not jeopardize the continued existence of listed species. During formal consultation under the Act, reasonable and prudent alternatives contained in biological opinions require agencies to insure they do not violate the jeopardy standard. Also, implementation of reasonable and prudent alternatives in biological opinions may require additional costs. The reasonable and prudent measures and terms and conditions covering incidental take included in the biological opinion also may require the agency incur costs. The Act also provides direction for all Federal agencies to use their authorities to seek to recover threatened and endangered species in section 7(a)(1). Providing for recovery actions also incurs costs. These costs are all associated with listing of a species and are not critical habitat costs.

Issue 23: One letter stated a concern that the delay in designating critical habitat has harmed the endangered fishes.

Service Response: The Service does not believe that delay in designating critical habitat has contributed to the decline of any of these four fish species. All four fishes enjoy the protection of the Act by virtue of their listing and, in accordance with section 7(a)(4), publishing of the proposed critical habitat rule required Federal agencies and the Service to confer on potential impacts of any Federal action upon proposed critical habitat. Additionally, prior to the designation of critical habitat, Federal actions that may affect the endangered fish required review for possible jeopardy to the species under section 7 of the Act, which reflect to large degree, if not completely, the same issues presented by adverse modification of critical habitat.

Issue 24: Several respondents indicated that the Service should set recovery goals based on numbers of fish so that it is evident when recovery is achieved.

Service Response: Critical habitat designation is not a management or recovery plan. Critical habitat serves to identify those areas where conservation efforts should be concentrated but does not dictate what those efforts should be, or set goals to measure the success of such efforts.

Recovery goals are appropriately contained in recovery plans. Recovery plans generally identify specific actions needed for the conservation of the species. Criteria for downlisting or delisting contained in recovery plans function as goals to be met to achieve species conservation. In the development of recovery plans, species experts determine the level of specificity of these goals, based on the status of the species and its biology. Goals based on specific numbers of individuals are only set if the biology of the species warrant it and in cases where reliable population estimates can be made.

Biological Comments

Issue 25: Some respondents indicated that little or no historic information exists that these fish species were ever found in some areas proposed for designation. Some believed that razorback suckers were not native to Arizona's interior rivers but were introduced there.

Service Response: The Service selected river reaches for this designation that are part of the historical range of these species. Historical or recent records regarding the existence and/or presence of these fish exist for almost all of these areas. For those few that do not have a historical or recent record, information from species experts was used, in addition to examination of nearest known locations and of the predevelopment river system to determine if the species was likely to have been present. Historical records indicate that Arizona's interior rivers were inhabited by the razorback sucker, but razorback suckers were extirpated by the 1960's. Efforts to reintroduce razorback suckers in these areas continue. Convincing evidence was presented during the comment period that some areas proposed for designation were outside of historical range of the subject species. This resulted in a change in boundaries as discussed elsewhere in this final rule.

Issue 26: Many respondents were concerned that the razorback sucker is found in some river reaches only because of stocking (reintroduction) programs and that these programs may not have been successful.

Service Response: Natural populations of the razorback sucker were extirpated from historical habitats in the Gila, Salt, and Verde Rivers by the 1960's. During the late 1970's and into the 1980's, efforts were made to reestablish these populations using hatchery reared fish. These efforts have not been as successful as hoped, but the Service believes that some of the introduced fish have survived in these systems where the razorback historically was a native fish.

Issue 27: A few individuals believed that these species should be allowed to go extinct because they cannot adapt to changes in the river systems.

Service Response: The Act provides the means to conserve the ecosystems upon which endangered species and threatened species depend. In section 2(a), the Act finds that wildlife and plant species have intrinsic values (aesthetic, ecological, educational, historical, recreational, and scientific values) that are worth preserving for the benefit of all citizens. The Act charges Federal agencies with insuring that their actions do not jeopardize the continued existence of the species. To fulfill that responsibility, Federal actions that affect these fish must provide for the habitat and biological needs of the species. Allowing a species to go extinct because it has not adapted to rapid habitat changes caused by human development is not permissible under the Act.

Issue 28: Many respondents commented that the Service needs more biological data to determine critical habitat and therefore no areas should be designated.

Service Response: The Act specifies that "The Secretary shall designate critical habitat * * * on the basis of the best scientific data available * * *." The Service has determined that the quantity and quality of existing biological data for these species is adequate for designation of critical habitat. These fishes have been the subject of intense study for over 10 years and a significant amount of information has been collected. The Service is confident that the best available commercial and scientific data has been used as required by the Act and that data is more than adequate to determine critical habitat.

Issue 29: Numerous respondents stated that the designation of critical habitat would not benefit these species.

Service Response: Designation of critical habitat provides an avenue to recognize and inventory areas important for the survival and recovery of a species. It also provides additional protection under section 7 consultations, especially for those areas not continuously occupied by individuals of the species, or from the effects of Federal actions upstream of the critical habitat.

Issue 30: Several respondents stated that all habitat in the Basin has been degraded and therefore should not be designated as critical habitat. Degradation may include seasonal drying of the river or portions thereof, changes to temperature and silt/sediment load, changes to the historical hydrograph, construction of dams and reservoirs, and introduction of nonnative fishes.

Service Response: The Service agrees that there are no remaining pristine river systems in the Basin to designate as critical habitat. However, while physical changes to the habitat have occurred, the areas proposed for designation maintain or have the potential to continue to support populations of these species. The four Colorado River endangered fishes species are adaptable to many physical conditions, and their survival in modified habitats such as reservoirs is an example. Furthermore, management actions to restore areas of physical habitat also are possible, so degradation may not be permanent.

Issue 31: Numerous respondents stated that nonnative fish species have adversely affected the endangered species, that the Service was primarily responsible for their introduction, and that this effect is more important to the survival of these species than changes to physical habitat. These respondents maintained that the presence of nonnative fish species in an area should preclude that area from designation as critical habitat.

Service Response: The Service recognizes and is concerned about the problems with and implications of the presence of nonnative fish species in the Basin. There are no river systems in the Basin that do not have established populations of nonnative fish species. In areas with more natural habitat conditions, the native fish are better able to compete with nonnatives. Over time, as habitat is restored, management actions to provide for recruitment of native fish to local populations can be taken to eliminate or reduce the effects of nonnative fish. The Service has and must consider the impacts of stocking nonnative fish prior to doing so or funding such actions. In the Upper Colorado River Basin, the Service is working with State agencies and others to protect these endangered fishes by developing a stocking policy for nonnative fishes.

Issue 32: Respondents indicated that additional areas should be included in the designation. Additions were suggested for proposed reaches and to rivers currently not included in designation.

Service Response: The Administrative Procedure Act requires Federal agencies to provide appropriate notification of proposed actions prior to making final determinations. Therefore, the Service cannot adopt a final rule that is significantly more restrictive than the proposed rule without first offering the public an opportunity to comment on the differences. Notice and public comment may only be waived in special cases, such as emergencies or in instances where a proposed amendment makes only minor technical changes in a rule. Some of these additional areas may warrant designation, and the Service will consider designating them at a later date through the rulemaking process with proper notice and comment. These areas include the Little Colorado River up to Blue Springs for humpback chub, additional areas for

humpback chub in the Grand Canyon, the Lower Colorado River for Colorado squawfish, and the Duchesne River up to the confluence with the Uintah River for razorback sucker and Colorado squawfish.

Issue 33: Many respondents questioned the need to designate flood plain areas. Reasons provided include: the river is too regulated to allow floods; agricultural, mining, oil and gas, residential, transportation facilities, and municipal development has occurred; and there will be considerable economic impact. They stated that inclusion of flood plain is not biologically supportable. Others recommended alternate flood plain elevations.

Service Response: Large river systems are composed of the mainstream channels and adjacent habitats that are inundated during the higher water levels that are usually associated with spring flows. These seasonally flooded habitats are major contributors to the natural productivity of the river system by providing nutrient inputs and making terrestrial food sources available to aquatic organisms. The extent of flooded wetlands in the Colorado River has been reduced by the construction and operation of water resource development projects. The remaining flood plain areas have great importance for recovery of endangered fish.

Recent studies in the Colorado River system have shown that the life histories and welfare of native riverine fishes are linked with the maintenance of a natural or historical flow regimen (i.e., a hydrological pattern of high spring and low autumn-winter flows that vary in magnitude and duration, depending on annual precipitation patterns and runoff from snowmelt). Ichthyologists have predicted that stream regulation that results in loss of flooding will result in extirpation of native fish species in the Colorado River system.

Inundated flood plains (bottom land habitats) are important for razorback sucker, Colorado squawfish, and perhaps the bonytail and humpback chubs. Wooded bottom lands, side and secondary channels, oxbow lakes, and flood plain wetlands provide nutrients, food, cover, and other features necessary for various life stages of these fish. In order to delineate such areas in designating critical habitat, the Service used the 100-year flood elevation (100-year flood plain). In no way is this determination meant to include all land within the 100-year flood plain as critical habitat nor does it imply a specific frequency of flooding will be required as part of the rule. Only those areas that provide one or more of the constituent elements can be considered for inclusion as critical habitat. Areas within the 100-year flood plain that have been previously developed are not likely to provide constituent elements when flooded.

Issue 34: Several respondents believed that the four fish species do not have enough in common biologically (habitat use, life history, etc.) to be included in this single designation. It will be too difficult to manage all four fish together.

Service Response: The historical ranges of the four species overlap. While the specific habitat components required by each species may not be identical, historical conditions created a variety of acceptable habitats within a reach of the river. This variety of habitats enabled more than one of the four species to use the area. Because the fish naturally coexisted together over much of their ranges, management efforts to restore habitats will likely provide the diversity of habitat components needed to support these species without having to provide discrete and separate management programs.

Issue 35: Many respondents stated that the area proposed for designation was too large.

Service Response: The size of the critical habitat areas is required to ensure that the life history requirements for species can be met. Larval drift, migratory behavior, and the need to maintain genetic diversity within species necessitates large reaches of river be designated. The Draft Biological Support Document provided life history information that discusses in detail those aspects that influence the amount of habitat required for survival and recovery. The designation meets the intent of the Act in not designating the entire historic ranges of these species.

Issue 36: Several respondents maintained that management of these areas should be the responsibility of the land owning agency, tribal governments, or private property owners, and that other laws provide for the management of wildlife and fish, making designation of critical habitat unnecessary.

Service Response: Federal agencies are responsible under the Act to insure that their actions do not jeopardize the continued existence of or adversely modify or destroy the critical habitat of a listed species. They are required to consider the presence of these species in their management. No other Federal or State law provides this level of protection for these resources. Non-Federal entities (States, tribes, or individuals) are not bound to consider critical habitat unless they are receiving Federal funding or permits to undertake a management action on their lands. In that case, the Federal agency's responsibility is invoked.

Issue 37: Some letters indicated that the selection of boundaries appeared related to landmarks rather than strictly for biological reasons.

Service Response: Exact reach endpoints and/or boundaries were indeed chosen for landmarks recognizable to an on-the-ground observer. The Service believes that it is important that the boundaries of critical habitat be as evident as possible. While each reach may have been adjusted in a minor way to landmarks at the upper and lower termini, the biological basis for reach selection was not compromised.

Issue 38: A few respondents indicated that the designation of critical habitat will improve water quality

Service Response: Maintaining the flows, habitat, and chemical parameters required by these fish species may have an influence on the changes in water quality that can be allowed within the critical habitat area. It is not certain how much, if any, change to existing water quality would result.

Issue 39: Some respondents asked questions regarding the designation of reservoirs and regarding full pool elevation.

Service Response: Data indicates that adult razorback suckers and bonytail chubs can survive in reservoirs. Large populations of these fish can be maintained in reservoirs, allowing for maintenance of genetic variability and providing stock for reintroduction and research. The full pool level in a reservoir is defined as the water surface elevation at full capacity. This does not mean that reservoirs should be maintained at full pool elevations, but that habitat is protected regardless of reservoir pool elevation.

Issue 40: Some respondents believed that the flow requirements for fish used in the economic analysis had an inadequate biological base.

Service Response: The best available commercial and scientific data were used in developing the flow scenarios used in the economic analysis. Flows for several river reaches have been developed by the Service as part of project reviews or RIP activities. These flow recommendations have been published by the Service in reports or biological opinions. For those river reaches with no published flow recommendation, the Service developed flow scenarios using the best available hydrological and biological information.

Issue 41: Several respondents believed the Service did not address the

role of the Colorado River native fish eradication programs on listed fish in the San Juan and Green Rivers.

Service Response: The Draft Biological Support Document contains a section that describes State and Federal fish removal projects on the San Juan and Green Rivers These projects were an attempt to temporarily remove native and nonnative fishes from new reservoir storage pools prior to sportfish stocking. These projects were not expected to permanently eradicate those species nor were they intended to remove those species from entire river systems. These projects probably had little net effect on listed species.

Issue 42: Two respondents indicated that the Upper Basin Recovery Implementation Program was not a substitute for designation of critical habitat.

Service Response: The RIP is not a substitute for the designation of critical habitat; however, the ultimate goal of both the RIP and the designation is the recovery (delisting) of these endangered fish. It is the intent of the Service to analyze and amend the section 7 Agreement and Recovery Implementation Program Recovery Action Plan of the RIP, as needed, in order for it to be a reasonable and prudent alternative for the destruction or adverse modification of critical habitat for all activities addressed by the RIP.

Issue 43: Some respondents indicated that the additional selection criteria for razorback sucker were too broad.

Service Response: The additional criteria used to aid the Service in selecting areas for proposal as critical habitat for the razorback sucker were broad to account for the various habitat conditions, geographic areas, and life history requirements throughout the species' range. The species has been shown to use a variety of habitats depending on geographic location and other factors such as nonnative fish interactions that affect their habitat. Given the wide variety of habitats used by various life stages of razorback sucker, the Service does not believe the additional selection criteria were too broad.

Issue 44: One respondent indicated that the final rule should include specified flows as constituent elements.

Service Response: The Service does not believe it would be appropriate to have specific flows included as constituent elements because: (1) Flow recommendations based upon site- or river-specific research are unavailable for most critical habitat areas, and (2) even though flow recommendations could be made for some critical habitat areas, these flows must be evaluated and perhaps adjusted in the future. Including specific flows as constituent elements would require the rulemaking process be followed to make changes in recommended flows as research became available. This would create administrative delays to respond to fishery research recommendations. The flows used in Brookshire et al. (1993) were developed solely for use in the economic analysis. In reviewing the impacts of future Federal actions on critical habitat, the Service will use the best scientific and commercial information available at that time, as required by the Act.

Issue 45: Several respondents were concerned that the Service intended to poison all the rivers to remove nonnative fish and that the poison would harm people, animals, plants, and the soil. They also indicated their displeasure concerning the loss of sportfish to recover the endangered fish.

Service Response: As stated previously, the designation of critical habitat does not require any particular management action or actions to occur. Critical habitat serves to identify and inventory those areas where conservation activities should occur. In the development of any specific plan to implement conservation actions in a particular critical habitat reach, the agency involved is required to follow all Federal and State laws and regulations prior to implementing the action.

The Service has identified the introduction of nonnative fish species into the Basin as a significant cause of the decline of native fish species. It is likely that the implementation of conservation actions may result in proposals to reduce the numbers of nonnative fish in a particular area. Techniques to reduce nonnative fish numbers include netting, trapping, electrofishing, liberalization of creel limits and equipment restrictions, physical habitat alterations or restoration, as well as the use of toxicants.

The Service, or any other agency, is required to follow Federal and State laws and regulations in order to use fish toxicants. These laws and regulations are in place to protect nontarget organisms (including people, animals, plants, and soils) from adverse effects of the toxicant. Fish toxicants in use today have been used safely in rivers, ponds, and reservoirs for many years.

Issue 46: A few respondents stated that unoccupied areas should not be designated as critical habitat, but designated experimental nonessential.

Service Response: The Service did not include any unoccupied habitat in this designation of critical habitat. All areas designated have recently documented occurrences of these fish and/or are treated as occupied habitat in section 7 consultations. There are two experimental nonessential populations for the Colorado squawfish in the Salt and Verde Rivers in Arizona. It is hoped that the species can be reestablished in Arizona through work under this designation. Protection of the fishes and their habitat is greater under section 7 of the Act compared with those provided by the experimental nonessential population classification, which is intended to provide management flexibility.

Issue 47: Several respondents questioned why the San Juan River critical habitat for the razorback sucker ended at the Hogback Diversion and extended to Farmington, New Mexico, for the Colorado squawfish.

Service Response: Biological information on the razorback sucker indicates that this species has an affinity for low velocity habitats such as backwaters and secondary channels. The geomorphology of the San Juan River below the Hogback Diversion provides these types of habitats. Upstream of the Hogback Diversion, the river channel is more restricted with faster-flowing, deeper water habitats, and few backwaters or secondary channels are found. Thus, for the razorback sucker, the area upstream from the diversion did not sufficiently possess the primary constituent elements to justify its inclusion as being necessary for this species' conservation.

Biological information on the Colorado squawfish indicates that the adult fish use low velocity areas, but not as much as younger life stages. Adult Colorado squawfish often use more high-velocity or deep water river sections, similar to those available in the reach of the San Juan River above the Hogback Diversion upstream to Farmington, New Mexico. This reach has been identified in the Colorado Squawfish Recovery Plan as being needed for downlisting of this species.

Economic Issues

Issue 48: Many respondents raised questions regarding the level of geographic disaggregation in the economic analysis.

Service Response: The direct impacts of critical habitat designation were determined at the river reach level. Economic data were available at the county level in the IMPLAN data sets and formed the basis of the analysis. However, it is inappropriate to conduct the economic analysis at the county level or tribal lands level because the

direct impacts in almost all cases extended beyond those immediate boundaries. Further, the indirect effects were State-wide and region-wide.

Issue 49: Concern was expressed that tribal economics are distinctly different than surrounding economics in that factor mobility (such as employment) is limited.

Service Response: While it is true that there are fewer opportunities for displaced workers on tribal lands, very few of the direct impacts, other than the Navajo Indian Irrigation Project, are tied to tribal economics. In the case of the Navajo Tribe, the impacts are reported in the New Mexico results.

Issue 50: Small distributors and users of hydroelectric power expressed concerns regarding the computation of and the use of the electric power impacts in the economic analysis, as well as issues regarding sunk cost, thermal replacement (fuel substitution), and the amount of thermal replacement required.

Service Response: The electric impacts were computed by Stone and Webster Management Consultants, Inc., utilizing a model developed for the Glen Canyon Dam. The model development effort was funded by the Bureau of Reclamation. The Service chose to use this model after determining this was the most up-to-date and comprehensive model available. Shut-in hydroelectric capacity is treated as a sunk cost in the analysis following accepted economic theory. Gas and coal activities are projected to expand to provide thermal power replacement. Existing excess capacity in these sectors means that this expansion is a benefit to the regional economy. The analysis of Stone and Webster yielded a result that 121 megawatts of additional thermal generation capacity would be required to offset the reduction of hydrogeneration capacity.

The small systems impacts were not available for inclusion in the Economic Analysis released November 12, 1993. The economic analysis was updated to include impacts associated with small systems as well as large system impacts. The updated results were used in the exclusion process and are included in the final rule.

Issue 51: Public comments expressed concern that all economic sectors and impacts of designating critical habitat were not addressed in the economic analysis.

Service Response: All models used in the economic analysis are general equilibrium in nature. That is, all impacts are represented through linkages among economic sectors. For example, both the direct impacts to hydropower production and the indirect effects on all other sectors such as agriculture, manufacturing, mining, and finance are represented. Thus, changes to one sector of the economy and the resulting impacts within all other sectors are fully captured in the economic results as indirect impacts.

Issue 52: Questions were raised concerning the reallocation of water and the sectors that were projected to utilize the reallocated water.

Service Response: In all cases, the reallocated water represented a benefit and thus was placed in a relatively low value use. For instance, in California, which incurs positive impacts, the choice for the sector to receive the reallocated water was the agricultural sector. If municipal and industrial had been chosen, then the positive impacts would have been much larger.

Issue 53: Concern was expressed regarding the lack of economic impacts resulting from flood plain designation.

Service Response: Information received during the public comment periods and previously available data did not indicate any major economic impacts related to flood plain designation. The Service recognizes that individual projects located in the flood plain may experience economic impacts.

Issue 54: Concern was raised by the Navajo Nation and its representatives regarding the expansion of the Navajo Indian Irrigation Project (NIIP).

Service Response: Based upon information provided during the public comment period, the New Mexico analysis was revised to include an additional 52,000 acre-feet of future water depletions foregone. Additionally, cropping patterns and yields for NIIP were adjusted based on information supplied by the Navajo Nation and the Bureau of Indian Affairs during the comment period. Likewise, when data provided during the comment periods seemed reasonable, those economic data were incorporated into the models.

Issue 55: Concerns were raised by several commenters about the lack of economic impacts identified in the Lower Basin. In some cases, hypothetical changes to existing Lower Colorado, Salt, Verde, and/or Gila River operations were provided to estimate economic impacts to agriculture and mining activities.

Service Response: At present, the Service does not foresee changes in current hydrological operations of these rivers occurring as a result of recovery efforts for these fishes. The impacts predicted by the commenters and the scenarios used to generate those impacts are not envisioned by Service biologists in the Lower Basin as necessary for recovery and survival of these fish.

Issue 56: One commenter indicated that the transfer of Colorado Eastern Slope agricultural water rights to municipal use would be impracticable or impossible due to endangered species constraints on the Platte River system.

Service Response: Construction of conveyance facilities to transfer Eastern Slope agricultural water to municipalities may require section 7 consultation with regard to Platte River endangered species. However, several such transfers have already occurred without any Federal action, demonstrating the feasibility of such transfers.

Issue 57: Concern was expressed regarding the comparability of the Input-Output (I–O) and Computable General Equilibrium (CGE) results.

Service Response: The underlying model assumptions differ. CGE models allow for greater factor mobility and substitution. I–O models do not permit impacts to communicate and adjust with geographic areas outside the State or region; thus negative impacts are overestimated. Therefore, due to these differences, results from these models are not directly comparable.

Issue 58: Concerns were raised regarding changes in governmental revenue flows from hydropower impacts.

Service Response: Such revenues represent transfers of economic resources, not real resource costs. The models capture changes in government revenues.

Issue 59: Concern was raised regarding a variety of projects planned for the region that were not specifically addressed in the analysis.

Service Response: Projects not specifically identified in the economic analysis were presumed to be undertaken and appear in the baseline projections. Further, some future projects have already undergone section 7 consultation and as such do not represent an impact. Future projects for which little or no information is currently available will be subject to section 7 consultation and as such it is premature to judge whether they will be affected.

Issue 60: Concerns were raised regarding the omission of the cost of capital facilities to use water such as planned municipal diversions.

Service Response: These costs would be incurred regardless of whether critical habitat is designated and as such are not an appropriate cost for inclusion in the analysis.

Issue 61: Respondents recommended that the economic benefits of listing and

critical habitat designation must be addressed.

Service Response: The economic analysis addresses both monetary cost and the benefits of designating critical habitat. Monetary values associated with the benefits of the existence of the species are not within the framework of the economic evaluation of critical habitat designation nor is such an evaluation required by the Act. These types of economic data would require extensive research and debate prior to being used in the evaluation of critical habitat.

Issue 62: A few respondents indicated that changing flows to benefit the endangered fish would be detrimental to people along the rivers.

Service Response: Designation of critical habitat is not a management plan for the recovery of these endangered fish. Specific management actions such as changing flows to benefit these fish will result from the RIP's, other recovery programs, and actions or project-specific requirements of biological opinions. Effects of flow changes due to Federal actions that benefit the endangered fish will be addressed through the NEPA process.

Issue 63: Several respondents questioned why only 10 percent of the cost of recovering these fish was attributed to critical habitat. Others were confused on how the Service arrived at the 90/10 percent split between species listing and critical habitat designation.

Service Response: The Act requires that the economic and other relevant impacts of designation of critical habitat be determined. This provision requires that the Service separate those costs specific to designation of critical habitat from the costs associated with the listing of these species. The Service used the extensive history of section 7 consultations that used the "jeopardy" standard to estimate the level of additional protection that might be provided by "adverse modification." Although the increased protection provided by critical habitat varies by impact type (flood plain activities, depletions, etc.), overall the Service determined that increased protection provided by critical habitat would account for approximately 10 percent of the total cost identified.

Issue 64: A few respondents questioned the selection of 1967–1985 for the hydrologic period to be used in preparation of the economic analysis. Some also indicated that using average flow years did not give an accurate portrayal of impacts.

Service Response: The Service selected the 1967–1985 period because it reflected the hydrology of the system with major water developments in place and operating without any operational changes due to endangered fish needs. Thus, this period was the most accurate one available for determining the full economic impact of reoperation of the river system for recovery of the endangered fish. Average, above average, and below average flow years were modeled.

Social Comments

Issue 65: Some respondents believed that humans are the real endangered species. Fish should not be considered more important than people. There is no benefit to people from these species.

Service Response: The Act strives to protect species that are in danger of becoming extinct in the immediate or foreseeable future. Humans are not in such danger. On the contrary, the number of humans has increased in the last 100 years at a rapid rate. Humans have, at times, believed that some other species may be of little or no value, when in fact the same species later has been determined to be of great value. In the past, the Colorado River fishes were of value to man for subsistence food, and they were widely taken for recreational and commercial reasons.

The four endangered fishes are considered of value to different segments of the human population for widely different reasons. As a case in point, one species, the Colorado squawfish has been valued by humans for several different reasons, including: (1) Historic value—it has been suggested that the food provided by this fish was of importance in the early settlement of portions of the West, and it was certainly used as food by American Indians; (2) food for humans—the literature is full of accounts of humans catching and eating Colorado squawfish, and its culinary qualities have been widely attested; (3) scientific—the potomadromous migrations and unique life cycle of this largest North American minnow is of great scientific interest and importance; and (4) ecological—as the top native predator of the Colorado River, it has a valid place in the natural Colorado River ecosystem.

Issue 66: Many respondents believed that the designation would adversely affect the quality of life in communities adjacent to critical habitat because loss of water rights, elimination of flood plain developments, prevention of new flood control projects and similar issues may result in destruction of communities.

Service Response: The designation will not take existing water rights nor will it require the removal of existing flood plain developments. Any new flood control project or other water development project would likely be subject to section 7 consultation, and if destruction or adverse modification of critical habitat were found, reasonable and prudent alternatives would be developed to address the project purposes. Actions without Federal involvement are not affected by the designation of critical habitat.

Issue 67: Several letters indicated that designation would adversely affect historic use of resources and lands.

Service Response: Existing development and use of water rights and non-Federal lands will not be affected by the designation of critical habitat except in cases where a Federal project or funding is required. Actions without Federal involvement are not affected by the designation of critical habitat.

Issue 68: Some respondents wondered how the designation would affect use of these rivers and reservoirs for recreation.

Service Response: The direct effects of critical habitat designation upon reservoir and river-based recreation are expected to be minor. Few Federal actions related to recreation are likely to "destroy or adversely modify" critical habitat. Power boating, rafting, swimming, fishing, and similar uses do not significantly impact or destroy the physical habitat of these species. However, these types of activities (flow changes, sport fish management, etc.) may be affected by specific efforts to recover these species. The Economic Analysis provided data on the potential economic impacts to recreational activities due to designation of critical habitat for these species. This information can be used to evaluate the significance of the effect of critical habitat will have upon the various recreation activities in and along the Colorado River system.

Issue 69: A few respondents stated that decisions affecting the quality and way of life in a community should be made locally and for the benefit of the local community.

Service Response: Congress has determined that endangered species consideration is of national importance and should be evaluated in a wider context. Effects to the local community are recognized in the process of designating critical habitat. However, the economic analysis and the exclusion process, according to the Act, only consider national and regional impacts. An area can be removed from the critical habitat designation if the economic costs of the designation are greater than the benefits to the species

and if exclusion is not likely to result in the extinction of the species.

Issue 70: Many respondents stated the need for balance between economic and environmental issues.

Service Response: The Economic Analysis and public comments were used by the Service during the exclusion process to achieve a balance between the needs of these species and economic and other concerns. The exclusion process allows for areas to be excluded from critical habitat designation if economic and other impacts exceed benefits for the listed species of concern, provided that exclusion will not result in the extinction of the species. The exclusion process allows economic and other issues to be weighed against the requirements of critical habitat under the Act.

National Environmental Policy Act

The Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in conjunction with regulations adopted pursuant to section 4(a) of the Act. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

Executive Order 12866 and Regulatory Flexibility Act

This rule was reviewed by the Office of Management and Budget under Executive Order 12866. Based on the information discussed in this rule concerning public projects and private activities within critical habitat areas, there are no significant economic impacts resulting from the critical habitat designation. There are a limited number of actions on private land that have Federal involvement through funds or permits that may be affected by critical habitat designation. Also, no direct costs, enforcement costs, information collection, or recordkeeping requirements are imposed on small entities by this designation. Further, the rule contains no recordkeeping requirements as defined by the Paperwork Reduction Act of 1990.

Taking Implications Assessment

The Service has analyzed the potential taking implications of designating critical habitat for the razorback sucker, Colorado squawfish, humpback chub, and bonytail chub in a Takings Implications Assessment prepared pursuant to requirements of Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights." The Takings Implications Assessment concludes that the designation does not pose significant takings implications.

References Cited

A complete list of all references cited herein is available upon request from the Service's Utah Field Office (see **ADDRESSES** above).

Authors

The primary authors of this rule are Henry R. Maddux, U.S. Fish and Wildlife Service, Utah Field Office (see **ADDRESSES** section); William R. Noonan, U.S. Fish and Wildlife Service, Colorado Field Office; Lesley A. Fitzpatrick, U.S. Fish and Wildlife Service, Arizona Field Office; and Harold M. Tyus, U.S. Fish and Wildlife Service, Region 6, Denver, Colorado.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Regulations Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations is hereby amended as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500, unless otherwise noted.

§ 17.11 [Amended]

2. Section 17.11(h) is amended by revising the Critical Habitat column for the entries "Chub, bonytail," "Chub, humpback," "Squawfish, Colorado," and "Sucker, razorback," under FISHES, to read "17.95(e)".

3. Section 17.95(e) is amended by adding critical habitat of the bonytail chub (*Gila elegans*), humpback chub (*Gila cypha*), Colorado squawfish (*Ptychocheilus lucius*), and razorback sucker (*Xyrauchen texanus*), in the same alphabetical order as each species occurs in § 17.11(h).

§ 17.95 Critical habitat—fish and wildlife.

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(e) * * *

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Bonytail Chub (*Gila elegans*)

Description of areas taken from the Bureau of Land Management (BLM) 1:100,000 scale maps (available from BLM State Offices): Rangely, CO 1989; Canyon of Lodore, CO 1990; Seep Ridge, UT/CO 1982; La Sal, UT/CO 1985; Hite Crossing, UT 1982; Parker, AZ/CA 1980; Davis Dam, AZ/NV/CA 1982; Boulder City, NV/AZ 1978; Needles, CA 1986.

Colorado: Moffat County. The Yampa River from the boundary of Dinosaur National Monument in T.6N., R.99W., sec. 27 (6th Principal Meridian) to the confluence with the Green River in T.7N., R.103W., sec. 28 (6th Principal Meridian).

Utah: Uintah County; and Colorado: Moffat County. The Green River from the confluence with the Yampa River in T.7N., R.103W., sec. 28 (6th Principal Meridian) to the boundary of Dinosaur National Monument in T.6N., R.24E., sec. 30 (Salt Lake Meridian).

Utah: Uintah and Grand Counties. The Green River (Desolation and Gray Canyons) from Sumner's Amphitheater in T.12S., R.18E., sec. 5 (Salt Lake Meridian) to Swasey's Rapid in T.20S., R.16E., sec. 3 (Salt Lake Meridian).

Utah: Grand County; and Colorado: Mesa County. The Colorado River from Black Rocks in T.10S., R.104W., sec. 25 (6th Principal Meridian) to Fish Ford in T.21S., R.24E., sec. 35 (Salt Lake Meridian).

Utah: Garfield and San Juan Counties The Colorado River from Brown Betty Rapid in T.30S., R.18E., sec. 34 (Salt Lake Meridian) to Imperial Canyon in T.31S., R.17E., sec. 28 (Salt Lake Meridian).

Arizona: Mohave County; Nevada: Clark County; and California: San Bernardino County. The Colorado River from Hoover Dam in T.30N., R.23W., sec. 3 (Gila and Salt River Meridian) to Davis Dam in T.21N., R.21W., sec. 18 (Gila and Salt River Meridian) including Lake Mohave up to its full pool elevation.

Arizona: Mohave County; and California: San Bernardino County. The Colorado River from the northern boundary of Havasu National Wildlife Refuge in R.22W., T.16N., sec. 1 (Gila and Salt River Meridian) to Parker Dam in T.11N., R.18W., sec. 16 (Gila and Salt River Meridian) including Lake Havasu up to its full pool elevation.

Known constituent elements include water, physical habitat, and biological environment as required for each particular life stage for each species.

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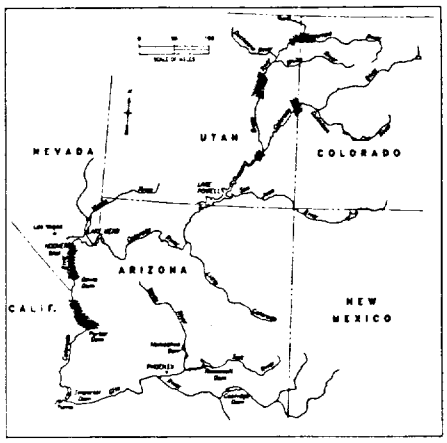

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Humpback Chub (*Gila cypha*)

Description of areas taken from BLM 1:100,000 scale maps (available from BLM State Offices): Rangely, CO 1989; Canyon of Lodore, CO 1990; Seep Ridge, UT/CO 1982; Vernal, UT/CO 1982; Grand Junction, CO 1990; Moab, UT/CO 1985; La Sal, UT/CO 1985; Tuba City, AZ 1983; Peach Springs, AZ 1980; Grand Canyon, AZ 1980; Mt. Trumbull, AZ 1979.

Colorado: Moffat County. The Yampa River from the boundary of Dinosaur National Monument in T.6N., R.99W., sec. 27 (6th Principal Meridian) to the confluence with the Green River in T.7N., R.103W., sec. 28 (6th Principal Meridian).

Utah: Uintah County; and Colorado: Moffat County. The Green River from the confluence with the Yampa River in T.7N., R.103W., sec. 28 (6th Principal Meridian) to the southern boundary of Dinosaur National Monument in T.6N., R.24E., sec. 30 (Salt Lake Meridian).

Utah: Uintah and Grand Counties. The Green River (Desolation and Gray Canyons) from Sumner's Amphitheater in T.12S., R.18E., sec. 5 (Salt Lake Meridian) to Swasey's Rapid in T.20S., R.16E., sec. 3 (Salt Lake Meridian).

Utah: Grand County; and Colorado: Mesa County. The Colorado River from Black Rocks in T.10S., R.104W., sec. 25 (6th Principal Meridian) to Fish Ford River in T.21S., R.24E., sec. 35 (Salt Lake Meridian).

Utah: Garfield and San Juan Counties. The Colorado River from Brown Betty Rapid River in T.30S., R.18E., sec. 34 (Salt Lake Meridian) to Imperial Canyon in T.31S., R.17E., sec. 28 (Salt Lake Meridian).

Arizona: Coconino County. The Little Colorado River from river mile 8 in T.32N., R.6E., sec. 12 (Salt and Gila River Meridian) to the confluence with the Colorado River in T.32N., R.5E., sec. 1 (Salt and Gila River Meridian).

Arizona: Coconino County. The Colorado River from Nautiloid Canyon in T.36N., R.5E., sec. 35 (Salt and Gila River Meridian) to Granite Park in T.30N., R.10W., sec. 25 (Salt and Gila River Meridian).

Known constituent elements include water, physical habitat, and biological environment as required for each particular life stage for each species.

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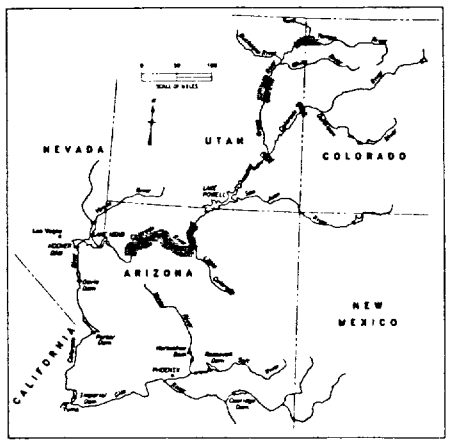

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Colorado Squawfish (*Ptychocheilus lucius*)

Description of areas taken from BLM 1:100,000 maps (available from BLM State Offices): Canyon of Lodore, CO 1990; La Sal, UT/CO 1985; Rangely, CO 1989; Delta, CO 1989; Grand Junction, CO 1990; Hite Crossing, UT 1982; Vernal, UT/CO 1990; Craig, CO 1990; Bluff, UT/CO 1985; Moab, UT/CO 1985; Hanksville, UT 1982; San Rafael Desert, UT 1985; Huntington, UT 1982; Price, UT 1989; Farmington, NM 1991; Navajo Mountain, UT/AZ 1982. The 100-year flood plain for many areas is detailed in Flood Insurance Rate Maps (FIRM) published by and available through the Federal Emergency Management Agency (FEMA). In areas where a FIRM is not available, the presence of alluvium soils or known high water marks can be used to determine the extent of the flood plain. Only areas of flood plain containing constituent elements are considered critical habitat.

Colorado: Moffat County. The Yampa River and its 100-year flood plain from the State Highway 394 bridge in T.6N., R.91W., sec. 1 (6th Principal Meridian) to the confluence with the Green River in T.7N., R.103W., sec. 28 (6th Principal Meridian).

Utah: Uintah, Carbon, Grand, Emery, Wayne, and San Juan Counties; and Colorado: Moffat County. The Green River and its 100-year flood plain from the confluence with the Yampa River in T.7N., R.103W., sec. 28 (6th Principal Meridian) to the confluence with the Colorado River in T.30S., R.19E., sec. 7 (Salt Lake Meridian).

Colorado: Rio Blanco County; and Utah: Uintah County. The White River and its 100-year flood plain from Rio Blanco Lake Dam in T.1N., R.96W., sec. 6 (6th Principal Meridian) to the confluence with the Green River in T.9S., R.20E., sec. 4 (Salt Lake Meridian).

Colorado: Delta and Mesa Counties. The Gunnison River and its 100-year flood plain from the confluence with the Uncompahgre River in T.15S., R.96W., sec. 11 (6th Principal Meridian) to the confluence with the Colorado River in T.1S., R.1W., sec. 22 (Ute Meridian).

Colorado: Mesa and Garfield Counties; and Utah: Grand, San Juan, Wayne, and Garfield Counties. The Colorado River and its 100-year flood plain from the Colorado River Bridge at exit 90 north off Interstate 70 in T.6S., R.93W., sec. 16 (6th Principal Meridian) to North Wash including the Dirty Devil arm of Lake Powell up to the full pool elevation in T.33S., R.14E., sec. 29 (Salt Lake Meridian).

New Mexico: San Juan County; and Utah: San Juan County. The San Juan River and its 100-year flood plain from the State Route 371 Bridge in T.29N., R.13W., sec. 17 (New Mexico Meridian) to Neskahai Canyon in the San Juan arm of Lake Powell in T.41S., R.11E., sec. 26 (Salt Lake Meridian) up to the full pool elevation.

Known constituent elements include water, physical habitat, and biological environment as required for each particular life stage for each species.

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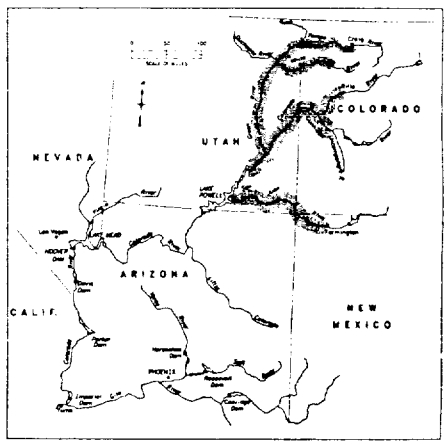

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Razorback Sucker (*Xyrauchen texanus*)

Description of areas taken from BLM 1:100,000 scale maps (available from BLM State Offices): Rangely, CO 1989; Canyon of Lodore, CO 1990; Seep Ridge, UT/CO 1982; La Sal, UT/CO 1985; Westwater, UT/CO 1981; Hite Crossing, UT 1982; Glenwood Springs, CO 1988; Grand Junction, CO 1990; Delta, CO 1989; Navajo Mountain, UT/AZ 1982; Vernal, UT/CO 1990; Craig, CO 1990; Bluff, UT/CO 1985; Moab, UT/CO 1985; Hanksville, UT 1982; San Rafael Desert, UT 1985; Huntington, UT 1982; Price, UT 1989; Tuba City, AZ 1983; Lake Mead, NV/AZ 1981; Davis Dam, AZ/NV/CA 1982, Parker, AZ/CA 1980; Yuma, AZ/CA 1988; Safford, AZ 1991; Globe, AZ 1980; Clifton, AZ/NM 1975; Prescott, AZ 1982; Theodore Roosevelt Lake, AZ 1982, Grand Canyon, AZ 1980; Mt. Trumbull, AZ 1979; Boulder City, NV/AZ 1978; Blythe, CA/AZ 1976; Trigo Mountains, AZ/CA 1988; Sedona, AZ 1982; Payson, AZ 1988; and U.S. Forest Service map: Tonto National Forest, Phoenix, AZ. The 100-year flood plain for many areas is detailed in Flood Insurance Rate Maps (FIRM) published by and available through the FEMA. In areas where a FIRM is not available, the presence of alluvium soils or known high water marks can be used to determine the extent of the flood plain. Only areas of flood plain containing constituent elements are considered critical habitat.

Colorado: Moffat County. The Yampa River and its 100-year flood plain from the mouth of Cross Mountain Canyon in T.6N., R.98W., sec. 23 (6th Principal Meridian) to the confluence with the Green River in T.7N., R.103W., sec. 28 (6th Principal Meridian).

Utah: Uintah County; and Colorado: Moffat County. The Green River and its 100-year flood plain from the confluence with the Yampa River in T.7N., R.103W., sec. 28 (6th Principal Meridian) to Sand Wash in T.11S., R.18E., sec. 20 (6th Principal Meridian).

Utah: Uintah, Carbon, Grand, Emery, Wayne, and San Juan Counties. The Green River and its 100-year flood plain from Sand Wash at T.11S., R.18E., sec. 20 (6th Principal Meridian) to the confluence with the Colorado River in T.30S., R.19E., sec. 7 (6th Principal Meridian).

Utah: Uintah County. The White River and its 100-year flood plain from the boundary of the Uintah and Ouray Indian Reservation at river mile 18 in T.9S., R.22E., sec. 21 (Salt Lake Meridian) to the confluence with the Green River in T.9S., R.20E., sec. 4 (Salt Lake Meridian).

Utah: Uintah County. The Duchesne River and its 100-year flood plain from river mile 2.5 in T.4S., R.3E., sec. 30 (Salt Lake Meridian) to the confluence with the Green River in T.5S., R.3E., sec. 5 (Uintah Meridian).

Colorado: Delta and Mesa Counties. The Gunnison River and its 100-year flood plain from the confluence with the Uncompahgre River in T.15S., R.96W., sec. 11 (6th Principal Meridian) to Redlands Diversion Dam in T.1S., R.1W., sec. 27 (Ute Meridian).

Colorado: Mesa and Garfield Counties. The Colorado River and its 100-year flood plain from Colorado River Bridge at exit 90 north off Interstate 70 in T.6S., R.93W., sec. 16 (6th Principal Meridian) to Westwater Canyon in T.20S., R.25E., sec. 12 (Salt Lake Meridian) including the Gunnison River and its 100-year flood plain from the Redlands Diversion Dam in T.1S., R.1W., sec. 27 (Ute Meridian) to the confluence with the Colorado River in T.1S., R.1W., sec. 22 (Ute Meridian).

Utah: Grand, San Juan, Wayne, and Garfield Counties. The Colorado River and its 100-year flood plain from Westwater Canyon in T.20S., R.25E., sec. 12 (Salt Lake Meridian) to full pool elevation, upstream of North Wash and including the Dirty Devil arm of Lake Powell in T.33S., R.14E., sec. 29 (Salt Lake Meridian).

New Mexico: San Juan County; and Utah: San Juan County. The San Juan River and its 100-year flood plain from the Hogback Diversion in T.29N., R.16W., sec. 9 (New Mexico Meridian) to the full pool elevation at the mouth of Neskahai Canyon on the San Juan arm of Lake Powell in T.41S., R.11E., sec. 26 (Salt Lake Meridian).

Arizona: Coconino and Mohave Counties; and Nevada: Clark County. The Colorado River and its 100-year flood plain from the confluence with the Paria River in T.40N , R.7E., sec. 24 (Gila and Salt River Meridian) to Hoover Dam in T.30N., R.23W., sec. 3 (Gila and Salt River Meridian) including Lake Mead to the full pool elevation.

Arizona: Mohave County; and Nevada: Clark County. The Colorado River and its 100-year flood plain from Hoover Dam in T.30N., R.23W., sec. 1 (Gila and Salt River Meridian) to Davis Dam in T.21N., R.21W., sec. 18 (Gila and Salt River Meridian) including Lake Mohave to the full pool elevation.

Arizona: La Paz and Yuma Counties; and California: San Bernardino, Riverside, and Imperial Counties. The Colorado River and its 100-year flood plain from Parker Dam in T.11N., R.18W., sec. 16 (Gila and Salt River Meridian) to Imperial Dam in T.6S., R.22W., sec. 25 (Gila and Salt River Meridian) including Imperial Reservoir to the full pool elevation or 100-year flood plain, whichever is greater.

Arizona: Graham, Greenlee, Gila, and Pinal Counties. The Gila River and its 100-year flood plain from the Arizona-New Mexico border in T.8S., R.32E., sec. 34 (Gila and Salt River Meridian) to Coolidge Dam in T.3S., R.18E., sec. 17 (Gila and Salt River Meridian), including San Carlos Reservoir to the full pool elevation.

Arizona: Gila County. The Salt River and its 100-year flood plain from the old U.S. Highway 60/State Route 77 bridge (unsurveyed) to Roosevelt Diversion Dam in T.3N., R.14E., sec. 4 (Gila and Salt River Meridian).

Arizona: Yavapai County. The Verde River and its 100-year flood plain from the U.S. Forest Service boundary (Prescott National Forest) in T.18N., R.2E., sec. 31 to Horseshoe Dam in T.7N., R.6E., sec. 2 (Gila and Salt River Meridian), including Horseshoe Lake to the full pool elevation.

Known constituent elements include water, physical habitat, and biological environment as required for each particular life stage for each species.

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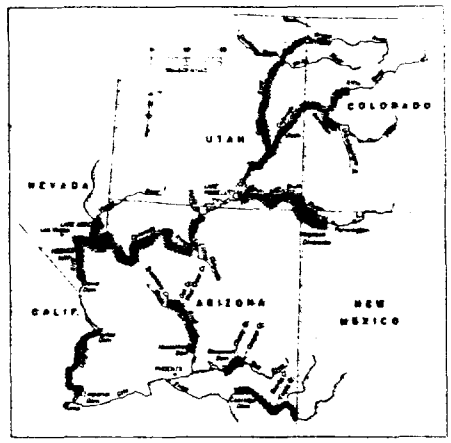

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Dated: March 10, 1994.

George T. Frampton,

Assistant Secretary for Fish and Wildlife and Parks, Department of the Interior.

[FR Doc. 94-6508 Filed 3-16-94; 11:28 am]

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